

THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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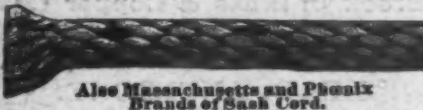
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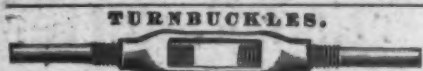
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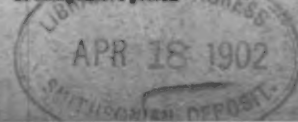
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THE IRON AGE

THURSDAY, APRIL 17, 1902.

The Epright Machine for Making Boiler Stays from Bars.

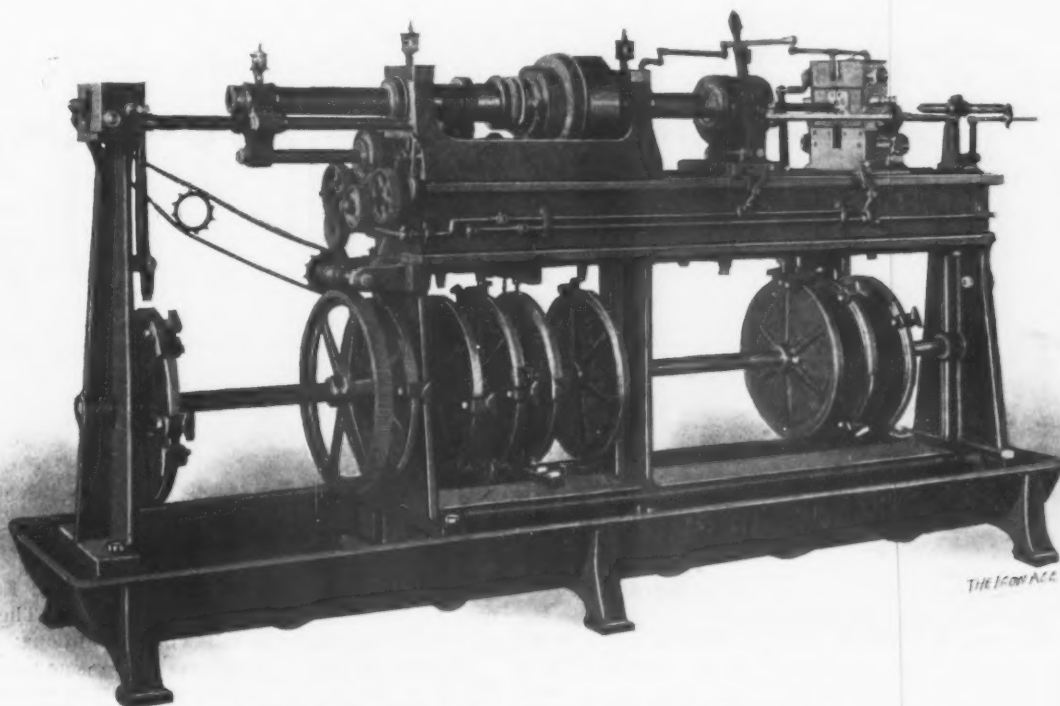
An automatic machine for producing boiler stays from the bar has been designed by A. W. Epright, scale inspector of the Pennsylvania Railroad, Altoona, Pa. The leading feature of the machine is to be found in the combination, in a bolt cutting machine, of successively acting cutting devices, one acting to cut down the body of the rod to be threaded, another cutting the threads at each side of the cut down portion, and a third cutting the finished bolt from the rod.

At the top of the frame are parallel guides, upon which the tool holding head is adjustably secured, and upon which the frame supporting the chuck clutch slides.

A supplemental frame which supports the sleeve bearing of the feed shaft is also adjustably secured on these

movement of the cam, release the rod and again grip it when moved in the opposite direction. This cam is operated by a depending lever, which is acted on at proper intervals by the dogs L l attached to the disk K. This disk, like the other selecting devices on the machine, is secured to the shaft I'. At times this shaft moves at different speeds, this being accomplished by changing the speed of the shaft which drives this one.

On the shaft I' are the disks K, K', K'', &c. As explained, the first actuates the friction feed device. The second, K', moves the sliding clutch, while K'' moves the clutch ring. The next disk is provided with four dogs, the action of one pair being to move the clutch ring to engaging position, and in the other direction for release. The other pair of dogs move it in the opposite direction for engagement and back to the neutral position. The disk K' also has two pairs of dogs. One pair moves a clutch to engage the belt wheel and to disengage it, while the other pair brings into action the gear along-



THE EPRIGHT MACHINE FOR MAKING BOILER STAYS.

guides. A sleeve driven by the gear B³, Fig. 3, is supported in suitable bearings. This sleeve has no longitudinal movement. Fitted in the sleeve is the hollow feed shaft C, which is keyed to turn with the sleeve and is free to move longitudinally. To the outer end of the shaft is secured the head C³, which moves in guides by means of a feed screw. At the inner end of the hollow shaft is a second head, D³, as shown in Fig. 5. This carries the clutch, which is shown in section in Fig. 7. Moving in a bearing formed in the head is a sleeve, D⁴, formed with a conical face oppositely inclined to that of the stationary head. The jaws D⁵ lie between the conical faces, so that when the movable head is moved toward the stationary head the jaws will be pressed toward the center to grip the bar passing between. When moved in the opposite direction the jaws relax their grip and permit the rod to move freely. This device is adjustable to rods of different diameters. The hollow feed shaft C, and through it the chuck clutch, is actuated by the gearing shown in Figs. 3 and 4. The rod is fed through the hollow sleeve by a gripping mechanism driven by the sprocket wheel G. A wedge shaped cam actuates the gripping rolls, which, at one

side the belt pulley. The next disk operates the sleeve O of the clutch H³ through the levers Q, Q'. The disk K' controls the chuck clutch at the end of the shaft C, already mentioned. The cutting dies are brought into action by the disk K', while the last disk controls the cutting down mechanism.

The cutting tools and their actuating devices are carried in the main head R, Fig. 5, which is adjustably supported in guides. The lower portion of the head is made with two slotted openings, R², Fig. 6, through which extends a shaft, r². Threaded perforations are formed through the opposite walls of the head, and open into the upper part of chambers containing the wheels shown. The dies holding slides are shown at T'. On the back of the guide R are guides in which move the slides S', supporting the cutting down tool, the inward movement of which is adjustable. The thread cutting dies, like the cutting down tool, are normally drawn outward by springs and are forced inward to cutting position by suitable mechanism.

Operation.

Immediately after the cutting off of a bolt from the end of the rod the first disk brings the friction rolls

into action to feed the bar forward through the chuck clutch, which has been opened immediately after the severance of the bolt, until it strikes the stop J^2 , which is in its operative position by this time. The bar being in this position, the proper cam acts upon the chuck clutch, so that it will close down upon the bar and grip

League, and since that time the members of this league have been actively at work in promoting a favorable sentiment toward reciprocity. The meeting just held at Chicago is an outgrowth of the movement set on foot in Kansas and represents a much broader constituency. The attendance comprised manufacturers and others

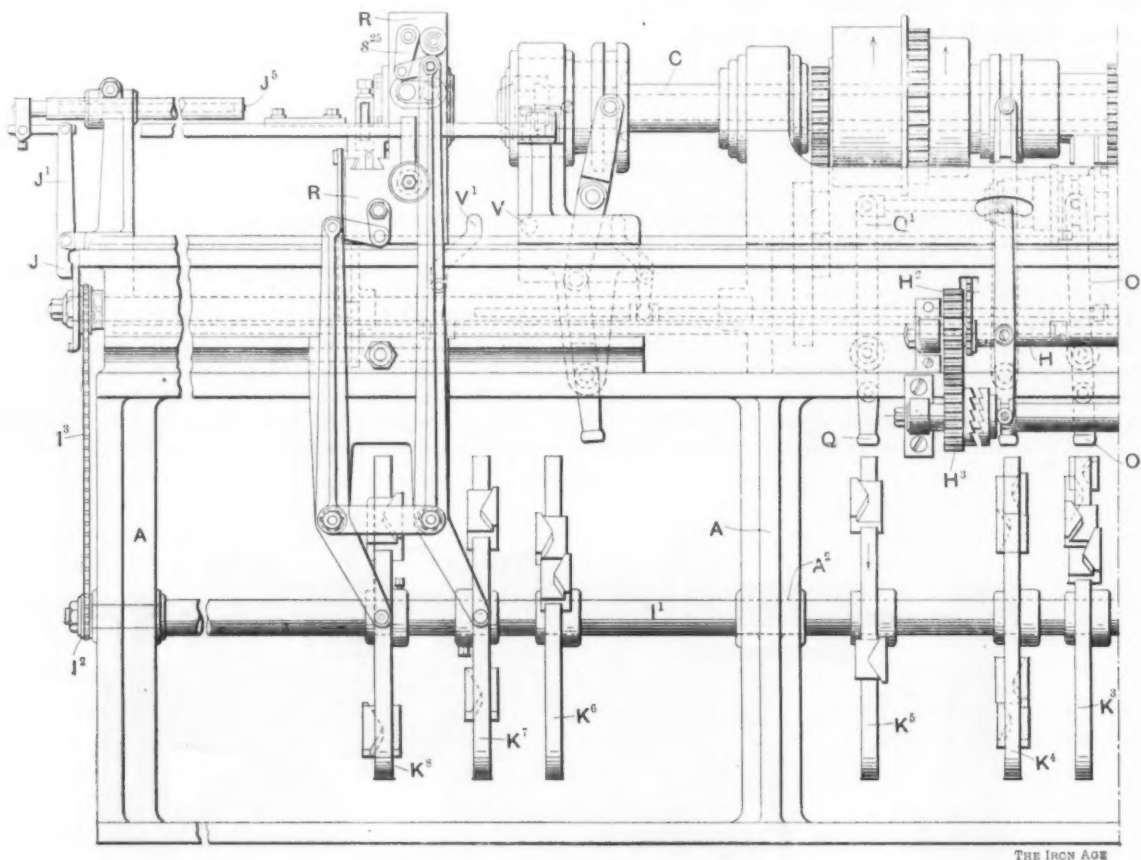


Fig. 2.

Figs. 2 and 3 Together Make Up a Side Elevation.

THE EPRIGHT MACHINE FOR MAKING BOILER STAYS.

it firmly to the hollow feed rod C, after which the wedge shaped cam acting on the friction wheels is again thrust in, so as to press the wheels outward out of contact with the bar. The bar is now in position to be operated upon, and the hollow shaft C is moved outward at the proper speed for the cutting down operation to be performed on the center of the bolt. The cutting down tool is then retracted, as is also the bolt, but at increased speed. When the bolt has reached the proper position the threading dies are closed down and the rod is fed forward while being threaded. The dies again operate upon the rear end of the bolt. The cutting off tool is then brought into action to sever the bolt from the rod.

Reciprocity Agitation in the West.

The movement in favor of reciprocity, which received a setback as a result of the deliberations of the National Reciprocity Convention at Washington last November, has by no means been abandoned. The feeling in favor of establishing better commercial relations with foreign countries through this policy is particularly strong in the West. That the agitation will be continued, and that it will be conducted with considerable energy, is shown by the action taken at a meeting held in Chicago last week by representatives of manufacturing and general business interests, called together by Governor Stanley of Kansas. Some three months since Governor Stanley called a meeting in Topeka, which resulted in the formation of the Western Reciprocity

League, and since that time the members of this league have been actively at work in promoting a favorable sentiment toward reciprocity. The meeting just held at Chicago is an outgrowth of the movement set on foot in Kansas and represents a much broader constituency. The attendance comprised manufacturers and others

Resolved, That the doctrine that there should be no modification of the tariff which involves any injury to any home industry permits each industry to be sole judge whether such modification will cause injury, prevents all reform in existing trade laws, however beneficial to the people in general such reform would be, and subordinates the interests of the many to that of the few, in place of which we propose broad, liberal commercial regulations beneficial to the people of the whole country.

Resolved, That the reciprocal treaties negotiated by Minister Kasson, under the direction and with the approval of President McKinley, should be promptly ratified as beneficial to the interests of the people of this country, and that further treaties along the same lines ought to be negotiated with the nations.

Resolved, That no matter what may be done with reciprocity treaties with other countries, a liberal treaty should be promptly negotiated with Cuba, which is virtually a ward of the United States, the present duties on Cuban products being unjustly much higher than the average duties on the products of other countries.

Resolved, finally, That the interests of an active minority should not prevail over those of a passive majority, and that in making tariff and reciprocal treaties with other nations the interests of American industries and of the American people as a whole ought to be considered.

For the purpose of conducting the agitation in favor of reciprocity, an organization was formed to be named the National Reciprocity League, whose membership will consist of all persons in favor of its objects and willing to pay a membership fee of \$2 a year to create a publicity fund for the publication and circulation of literature of the organization. Governor Stanley was elected president and A. B. Hult of Topeka secretary. H. C. Staver was made chairman of the Board of Di-

rectors, whose membership includes such representative men as G. Watson French of the Republic Iron & Steel Company, James Deering of the Deering Harvester Company, A. B. Farquhar of York, Pa., and S. R. Callo-way of New York.

Another convention, to which representatives from

be crowned with success. The belief was expressed that the present condition of very great domestic prosperity has only temporarily lessened interest in this subject among manufacturers, but that existing conditions should not be permitted to interfere with a movement which will be productive of great benefit to the business

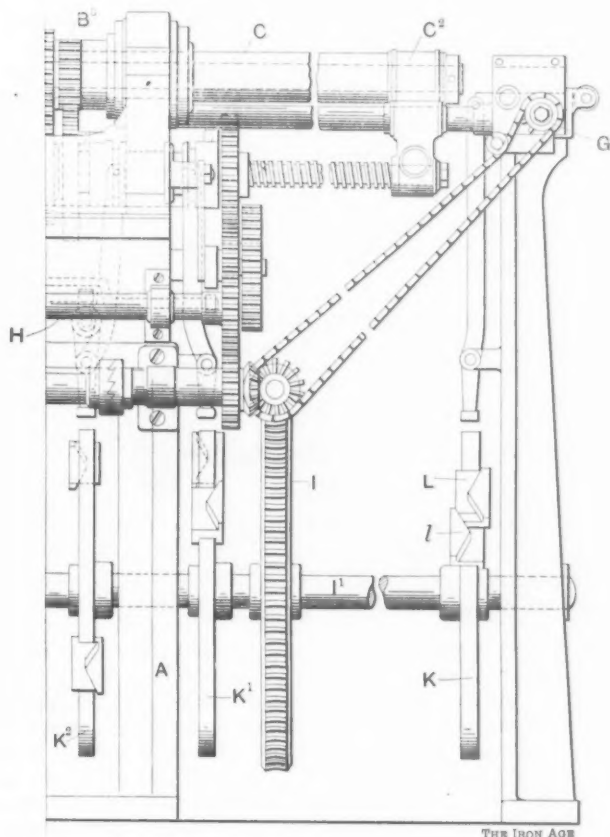


Fig. 3.

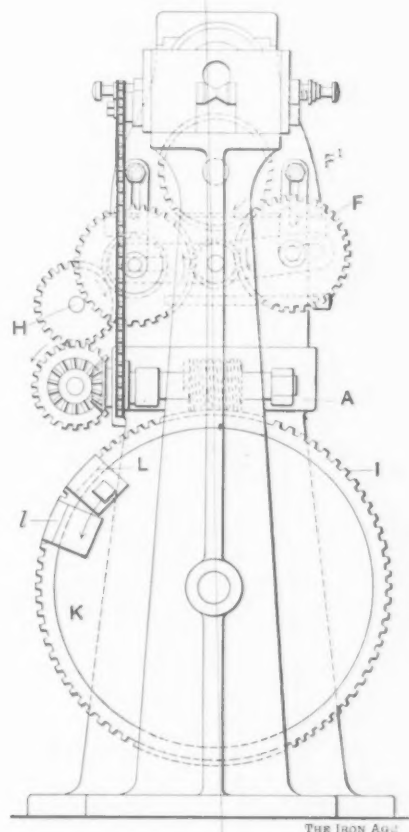


Fig. 4.—End View.

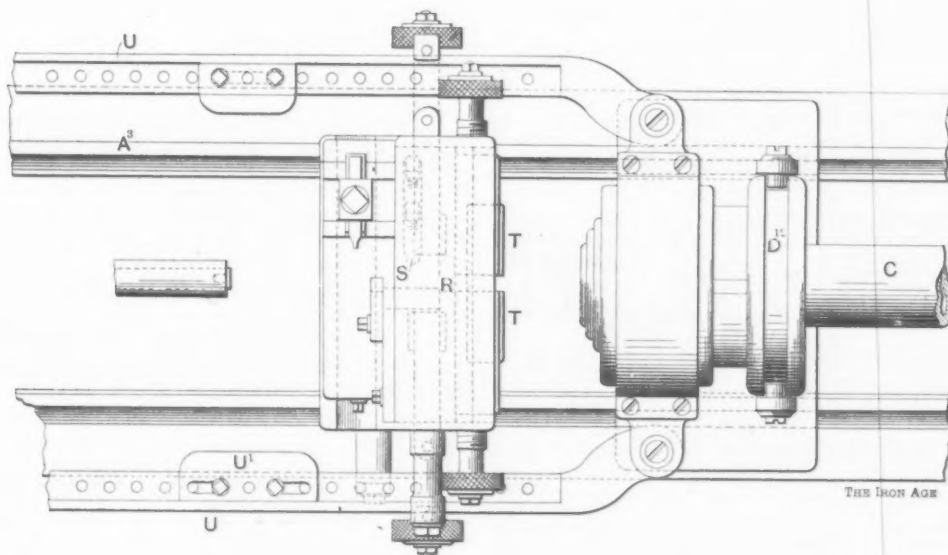


Fig. 5.—Enlarged Plan View of Rod Chuck and Cutting Tool Guides.

THE EPRIGHT MACHINE FOR MAKING BOILER STAYS.

all industries will be invited, will probably be called during the summer. The proceedings of the convention just held comprised, in addition to the organization of the new league, a free interchange of opinion relative to reciprocity. The views thus expressed showed a most enthusiastic belief in this policy, and the determination on the part of those present to continue to advocate reciprocity in the belief that eventually their efforts will

interests of the country when the tide of prosperity begins to ebb.

A New Coke Furnace at Detroit.—A company will shortly be organized to operate a blast furnace in the vicinity of Detroit, Mich. The capital stock has been placed at \$1,500,000, all of which has been subscribed by Cleveland, Pittsburgh and Detroit capitalists. M. A.

Hanna & Co. of Cleveland have taken a good sized interest, will furnish the ore and will sell the product. The furnace will be located on Zug Island, adjoining

pany are producing large quantities of coke in by-product ovens. They have agreed to furnish for ten years all the coke necessary for a 300-ton furnace at a price

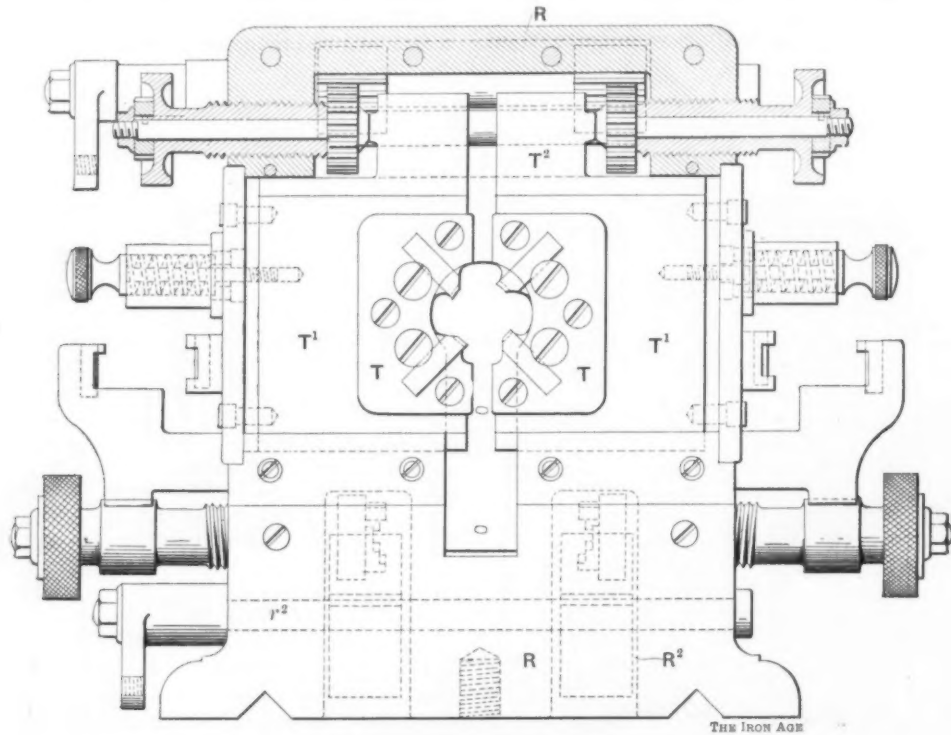


Fig. 6.—Front View of Head.

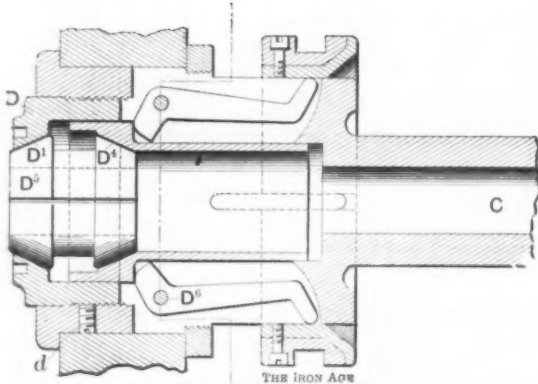


Fig. 7.—Section through Chuck Clutch.

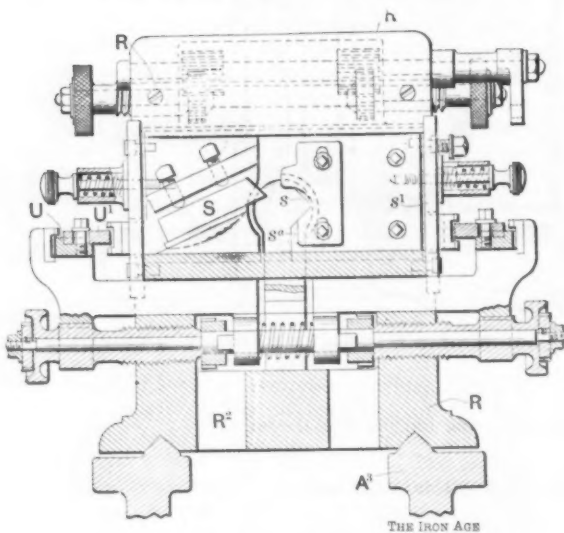


Fig. 8.—Cross Sectional View of Cutting Head.

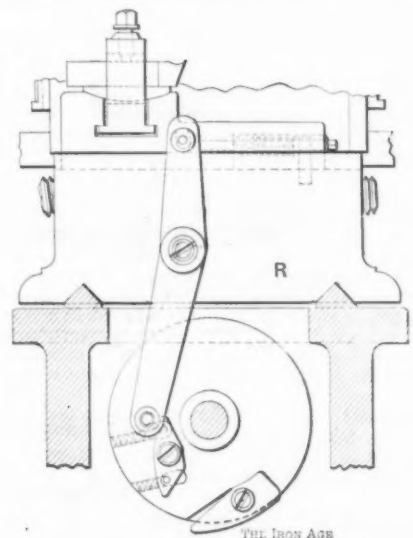


Fig. 9.—Elevation Showing Cutting Off Mechanism.

THE EPRIGHT MACHINE FOR MAKING BOILER STAYS.

the Solvay Process Company's plant, a few miles south of Detroit, at the junction of the Rouge and Detroit. The tract fronts the Detroit River and is supplied with excellent railroad facilities. The Solvay Process Com-

pany are practical mill men, and that they have been offered 20 acres of land as a site for the plant. They have asked for a bonus of \$10,000 to secure the location of the works at that point.

not exceeding \$2.25 per ton. The furnace contemplated will have a capacity of 250 to 300 tons daily and will be built on the most approved modern plan. It will be 77 x 17½ feet. It is claimed that pig iron can be produced at this point at a saving, as compared with furnaces in Ohio and Pennsylvania, of 60 cents per ton on ore and from 50 to 75 cents per ton on coke. It is expected that market will be found in Detroit for the entire output of the furnace. The saving in freight in reaching Detroit consumers is from \$1.25 to \$1.50 per ton. Detroit has in the past produced large quantities of pig iron, but it has been made exclusively with charcoal as fuel.

A project is on foot for the erection of a rolling mill at Brazil, Ind. Local newspapers state that the pro-

The Lovering Drawback Bill.

The Question of Revenue.

WASHINGTON, D. C., April 15, 1902.—The Ways and Means Committee, which last week held an extended hearing on the Lovering bill, designed to simplify and reform the general drawback laws with a view to stimulating export trade in various lines of manufacture, has taken the measure up for consideration, and has referred it to the Treasury Department for an opinion as to the probable effect of such a law. The committee desires information upon two specific points: 1, As to the probable loss of revenue under the proposed statute; and, 2, as to whether the interests of the Government and of the domestic producer of raw materials could be fully safeguarded by executive regulations.

The subject is one of so much importance and the data upon which to formulate a report are so meager that the Department will probably devote considerable time to considering the measure before replying. The correspondent of *The Iron Age* is in position to state that the chief anxiety of the Department concerning the probable effect of the measure relates to the revenue which might be lost as the result of its operation. This apprehension, there is good reason to believe, is quite unfounded, but it is realized that no amount of study devoted to available statistics concerning drawbacks will shed much light on this phase of the subject. According to the compiled figures of the Treasury Department for the fiscal year ending June 30, 1900, the total paid in drawbacks was \$5,215,502, and it is significant that this was nearly a quarter of a million dollars less than the amount paid in the year 1900, which was \$5,430,397. The largest single item was tin cans, on which the drawback was \$1,495,002; sugar and other saccharine products were second with a total of \$1,077,449; leather stood third with \$960,719, and bags fourth with \$404,508. Aside from these items the aggregates paid in drawbacks on the products of any single industry were comparatively insignificant, amounting altogether to but \$1,277,824.

These figures, it will be observed, furnish no clew as to the expansion that might occur under such a law as that suggested by Mr. Lovering, and if they show anything it is that the items upon which the largest drawbacks are now paid would not increase greatly under the projected law, for in the matter of tin cans, sugar, leather and bags very little difficulty is now experienced in securing drawback of duties on all of these products for which a foreign market can be found. As a matter of fact, the plants producing these goods for export are devoted almost exclusively to that branch of the business and do not manufacture for domestic consumption.

It is quite obvious, however, that the gain in exports under the Lovering bill would be in those lines which are now so seriously hampered by the law and regulations thereunder as not to be able to take advantage of the benefit of drawback, and on this point the official statistics furnish no information. But in the nature of things, increased drawbacks would require to be predicated upon increased importations of dutiable materials, and this fact is being urged upon the Treasury Department for the purpose of dissipating any fear lest the proposed law would make serious inroads upon the revenue. Upon this point Mr. Lovering, who has made a 'very close study of the subject,' said to the correspondent of *The Iron Age*:

I have no doubt that the effect of this bill, if enacted, will be to very materially increase the amount of rebates that will be paid, but it does not necessarily follow that this will mean any loss whatever to the Government. The present aggregate of rebate payments per annum is about \$5,000,000, which, of course, is infinitesimally small. Should this bill become a law, I should hope to see this amount increased many times, for that is one of the objects of the bill. This increase, however, would result not from the repayment of duties which now go into the Treasury, but from the repayment of duties on materials which are not now imported at all. In other words, American manufacturers in all trades

are obliged to decline orders for goods for export because they cannot meet competitive prices in foreign markets on account of the high cost of domestic materials or the difficulty of securing drawback of duty on foreign materials. Now, it is very clear that if this bill enables our manufacturers to go more largely into the export business it will compel them at the same time to import raw materials in correspondingly increased quantities. The result will be a very important increase in the customs revenue, from which the Government will be enabled to pay the increased rebates. In a nutshell, the bill is designed to increase our exports, and it is a very simple arithmetical proposition that if it accomplishes this purpose it will of necessity increase the imports of dutiable raw materials proportionately. It is perfectly obvious that if the imports of raw materials, and hence the duties paid thereon, are not increased there will be no increase in the amount of drawback paid, for the one depends directly on the other.

It has been suggested that, from a revenue standpoint, this bill may operate to cause manufacturers to export, with benefit of drawback, goods produced from imported materials which are now consumed in products made for the domestic trade, and that this would compel the Treasury Department to increase the amount of drawback paid without any corresponding increase in dutiable foreign materials imported. This suggestion, while ingenious, is without the slightest basis in fact or reason. Foreign materials are now imported for use in the production of goods for the domestic trade simply because there is a demand for them, either because of their cheapness or their peculiar quality. If domestic material would serve as well the foreign would not be brought in. Now, no one will for a moment contend that there is likely to be any decrease in the demand hereafter in the domestic trade for raw materials, hence the home market may be counted upon to continue to absorb a constantly increasing quantity of both foreign and domestic materials, and it therefore follows that if our manufacturers succeed in securing a larger share of foreign business as the result of the passage of this drawback bill they will be compelled to import foreign raw materials in proportion.

Reduced to its simplest terms this is a very simple proposition. The bill merely relieves the exporter of the necessity of identifying the raw materials in his finished goods, but it still makes it necessary for him either to import an equivalent quantity of such raw material, or to purchase it from some one who has imported it. There is no chance whatever either to defraud the revenue or to reduce the national income by compelling the Treasury Department to give up any part of the duties which it now receives. The export business created under this bill will be new business, and the drawbacks paid will be disbursed from duties which do not reach the Treasury Department at all.

W. L. C.

Destructive Fire at the Durango Iron & Steel Works.

With the exception of the rolling mill and blast furnace, the entire plant of the Mexican National Iron & Steel Company, situated near the famous "Iron Mountain," at Durango, Mexico, was destroyed by fire on the night of the 8th inst. The loss is placed at \$300,000. There is no insurance. The fire broke out at about 9 p.m. in the carpenter shop. Lack of water and inadequate facilities for fighting the fire prevented any effective efforts to save the property. The works have been idle for two or three weeks past on account of a shortage of pig iron. G. L. Callanan, the general manager and vice-president of the company, has been in the United States for the past month, and is expected at the works daily. The fire entails a serious loss to Durango. It is feared that the plant will not be rebuilt.

The first of the two blast furnaces now building at Portoferallo, Elba, is to blow in on January 1, the second to follow later. The company are entitled Société Minière et Hauts-Fourneaux Elba.

Our Production of Open Hearth Steel.

The American Iron and Steel Association has published the following report:

The total production of open hearth steel in the United States in 1901, including direct steel castings, was 4,656,309 gross tons, against 3,398,135 tons in 1900, an increase of 1,258,174 tons, or over 37 per cent. The production of open hearth steel has more than doubled in the last four years, having increased from 2,230,292 tons in 1898 to the figures above given for 1901. The following table gives the production of open hearth steel ingots and castings, by States, since 1898:

States.	1898. Gross tons.	1899. Gross tons.	1900. Gross tons.	1901. Gross tons.
New England.....	47,381	57,124	74,522	170,876
New York and New Jersey	47,957	61,461	67,361	82,985
Pennsylvania	1,817,521	2,393,811	2,699,502	3,594,763
Ohio	79,886	117,458	130,191	184,943
Illinois	183,103	246,183	285,551	398,522
Other States.....	54,444	71,279	141,008	224,220
Totals.....	2,230,292	2,947,316	3,398,135	4,656,309

In 1900 our open hearth steel production for the first time exceeded that of Great Britain, which then amounted to 3,156,050 tons. Great Britain's production in 1900 was the largest in her history. Our open hearth steel made in 1901 was produced by 90 works in 14 States—Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Delaware, Tennessee, Alabama, Ohio, Indiana, Illinois, Wisconsin and Missouri. In 1900 94 works and 17 States made open hearth steel. Neither Maryland, Kentucky, Michigan nor Minnesota produced open hearth steel in 1901, although all four States were producers in 1900. Rhode Island made open hearth steel for the first time in 1901.

In 1900 the production of open hearth steel by the basic process amounted to 2,545,091 tons, and by the acid process to 853,044 tons. In 1901 3,618,993 tons were made by the basic process and 1,037,316 tons were made by the acid process, as follows, by States:

States.—Gross tons.	Basic open hearth steel.	Acid open hearth steel.	Total. Gross tons.
New England.....	87,529	83,347	170,876
New York and New Jersey..	46,805	36,180	82,985
Pennsylvania	2,840,230	754,533	3,594,763
Ohio	120,146	64,797	184,943
Illinois	353,395	45,127	398,522
Other States.....	170,888	53,332	224,220
Totals	3,618,993	1,037,316	4,656,309

The total production of open hearth steel castings in 1901, included above, amounted to 301,622 gross tons, of which 94,941 tons were made by the basic process and 206,681 tons were made by the acid process. In 1900 the production of open hearth steel castings amounted to 177,491 tons, of which 42,644 tons were made by the basic process and 134,847 tons by the acid process. The following table gives the production of open hearth steel castings by the acid and basic processes in 1901 by States:

States.—Gross tons.	Acid castings.	Basic castings.	Total. Gross tons.
New England, New York and New Jersey	33,165	3,989	37,154
Pennsylvania	104,631	3,855	108,486
Ohio, Indiana, Illinois and other States	68,885	87,097	155,982
Totals	206,681	94,941	301,622

The Iron Industry of Italy.—The production of iron ore according to the latest official statistics of Italy was 236,549 metric tons in 1900, against 247,278 tons in 1899. The production of manganese ore was, respectively, 4356 and 6014 tons, while the output of manganiferous ore was 3075 tons in 1900 and 26,800 tons in 1899. The exports of iron ore from Elba were 199,828 tons in 1900, against 227,622 tons in 1899. The production of pig iron rose from 19,218 tons in 1897 to 23,990 tons in 1900. The output of iron and steel was 306,405 tons in 1900, including 159,600 tons of iron and 77,815 tons of steel, bars, sheets, plates, beams and angles; 15,300 tons of iron wire, nails, &c.; 2000 tons of iron tubes, 8190 tons of steel rails, 7234 tons of steel

castings for the navy and 10,000 tons of tin plates. The production of steel ingots was only 13,736 tons, the iron and steel industry of Italy consisting chiefly of reolling old material.

The Gayley Laboratory.

On Saturday, April 5, the formal presentation took place at Easton, Pa., of the new laboratory of chemistry and metallurgy presented by James A. Gayley, first vice-president of the United States Steel Corporation, to Lafayette College, from which institution he graduated in 1876.

The opening exercises were held in the auditorium of Pardee Hall, Prof. Edward Hart, who occupies the chair of chemistry, making some introductory remarks, which were followed by an address delivered by President Ira Remson of Johns Hopkins University on "The Significance of Chemical Laboratories."

Dr. T. M. Drown, president of Lehigh University, chose as his theme "The Contributions of Chemistry to Sanitary Science," Dr. Drown having been at the time Mr. Gayley's professor of chemistry.

The third formal address was that of Henry M. Howe of Columbia College on "Metallurgical Laboratories."

At the conclusion of these addresses the assembled guests proceeded to the entrance of the laboratory, where the formal presentation was made by Mr. Gayley, and accepted by John W. Hollenback, president of the Board of Trustees. The proceedings closed with a dedicatory prayer with benediction by the Rev. Samuel A. Gayley, the father of Mr. Gayley, who graduated from Lafayette College in 1847.

The Laboratory.

The Gayley Laboratory of Chemistry and Metallurgy is a three-story building, constructed of mottled brick with trimmings of Indiana limestone and terra cotta. It is 88 feet long by 73 feet, entrance depth. The building is fire proof and is so far as possible arranged to preserve all the exposed iron work from the attack of acid fumes. On the ground floor are the steam heating apparatus and coal cellars, lavatory, stock room, beginners' laboratory room for 116 men, the assay room, metallurgical laboratory, crystallizing room and room for water and gas analysis. On the first floor the Henry W. Oliver Library and Museum, established by Mr. Oliver of Pittsburgh, is located. There is also a large lecture room for 125 men, the professors' offices and preparation room, a stock room and laboratory for 44 advanced workers. The second story contains the qualitative and quantitative laboratories, with room for 44 men in each, two balance rooms and a small auditorium.

Over the hallway is a third story containing the photographic room and the dark room.

Some of the special features of the building are described as follows by Professor Hart:

"The walls have an air space throughout to keep them dry. The floors and roof are supported on steel beams, upon which are laid cement floors strengthened with expanded metal. These floors are 4 inches thick and calculated to support 150 pounds per square foot. The partitions are also of expanded metal or small I beams covered and filled with plaster. They are only 2 inches thick, but very strong and stiff. The ceilings are high to give plenty of air and the windows large to give plenty of light. On either side are three large flues 18 inches in diameter, against which the hoods are placed. There are three 6-inch openings into each of these hoods one from each flue, giving a strong draft and at the same time ventilating the laboratory. With a little care we think this will be sufficient. Without care, in a college laboratory, nothing is sufficient. When bromine is being boiled or hydrogen sulphide made on the desk, or a solution of sulphurous acid evaporated, nothing but forced draft and wide open windows will make the room inhabitable. The ceilings are plastered with cement, which, we hope and believe, will

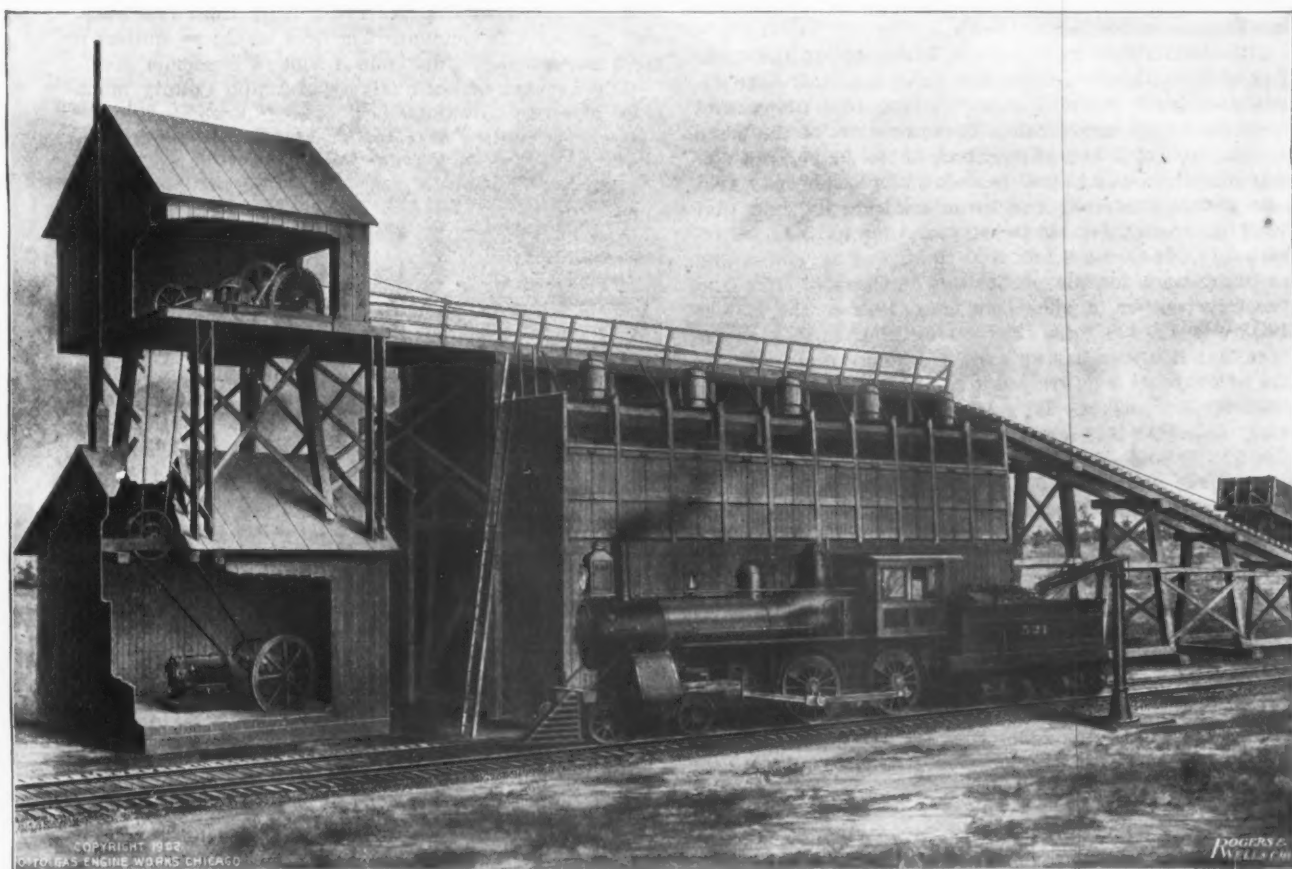
not peel off, and the walls painted with cold water paint. This we expect to brush off with wire brushes and renew as often as may be necessary. The steel beams have been covered with the best asphalt varnish we could find. This is believed to be the best protective covering where the metal is exposed, as here, to acid vapors. It can be, as you will see, renewed as often as is necessary."

One striking feature of the laboratory is its general appearance of simplicity and the complete absence of all showy display.

Among those present at the dedication ceremonies were: Charles M. Schwab, president of the United States Steel Corporation; W. B. Dickson, W. R. Walker, William Edenborn, member of the Executive Committee; D. M. Clemson, Charles W. Baker, J. Warner Allen and D. H. Doble, also connected with the United States Steel Corporation. Oliver Williams and Samuel Thomas

expensive machine which might be used to greater advantage in regular railroad service, but also necessitates the employment of a crew of men. The old system in use in many cases further involves the shoveling of the coal from the cars into bins, requiring more men.

The modern idea in railroad management as well as in other branches of business involving the use of labor and machinery is to reduce cost as much as possible by taking advantage of improved mechanical appliances. There is no reason why coal should not flow to the tender of a locomotive in the same way that water flows from an elevated tank, and it can be controlled practically in the same fashion. The arrangement here shown provides for the hauling of the coal in cars having dumping bottoms to enable them to discharge into bins which hold anywhere from 5 to 500 tons, the bins being elevated sufficiently for the coal to flow from them into the tender. Instead of using a locomotive to



COALING CHUTE OPERATED BY GASOLINE ENGINE.

of Catasauqua; B. F. Fackenthal, Jr., president of the Thomas Iron Company, Easton, Pa.; I. P. Pardee and W. L. Ayres of Hazleton; W. L. Sheaffer, Pottsville; John M. Hartman of Philadelphia; Prof. John A. Brashear, Pittsburgh; David Williams, publisher *The Iron Age*; W. B. Kunhardt of the Carpenter Steel Company, New York; Edwin Thomas, Catasauqua, Pa.; William Kent, associate editor of the *Engineering News*; O. C. Gayley, general agent of the Safety Car Heating & Lighting Company, New York, and Dr. C. B. Dudley, Altoona, Pa.

A Coaling Chute Operated by Gasoline Engine.

The accompanying illustration shows a coaling chute for supplying coal to locomotives, designed by T. W. Snow, 360 Dearborn street, Chicago, manager of the Western branch of the Otto Gas Engine Works. Mr. Snow has equipped quite a number of coaling stations on Western railroads in this manner, and the plan is rapidly growing into greater favor. The method in general use is to employ a locomotive to push a car of coal up an incline to the coal chute. This requires not only a very

push cars up the incline, a gasoline engine is installed for this purpose. An engine of this character being easily operated, one man in attendance can handle all the coal and water at one station at the same time. The engine can be used with very great economy, as the expense of operation ceases as soon as the engine stops.

The gasoline engine is of 30 horse-power. Its power is conveyed through a countershaft with a leather belt to the Lidgerwood hoist above with link belt and sprocket wheels. The belt runs over a tight and loose pulley on the engine to a tight and loose pulley on the countershaft. The full horse-power of the engine may be reached in 30 seconds. The cable, which is 600 feet long, is wound around the drum of the hoist. The capacity of this engine is to elevate a car of 150,000 pounds gross weight up a 20 per cent. grade at 20 feet per minute. While this is not a very high speed, it is fast enough, as the man in attendance seldom has over five or six cars a day to elevate, and he would have spare time no matter what the speed might be. It has been demonstrated by careful accounting that the cost of coaling locomotives by this method as compared with the old plan has been reduced from about 20 cents per ton to less than 3 cents per ton.

The Iron Resources of Texas.*

BY DR. WM. B. PHILLIPS, AUSTIN, TEXAS.

It has been known for many years that in the eastern, or rather in the northeastern, part of the State there are extensive deposits of good limonite (brown ore), and that in the central part, in the county of Llano, &c., there are deposits of hematite and magnetite of excellent quality but unknown extent. It is also known that up to this time no workable deposits of coking coal have been found in the State. So far as concerns the fuel question and local production of pig iron, Texas must use charcoal, or bring in coke from the Indian Territory, Colorado, New Mexico or Alabama. With our present lights we can put to one side the use of lignite as fuel in the blast furnace. Whatever success might accompany its use in a small furnace and on a very limited scale (and this is problematical), no metallurgist or blast furnace manager could advise the use of it on a commercial scale.

It is a fact that in Northeast Texas and in the counties of Rusk, Marion, Cherokee, Cass, &c., there are deposits of good limonite of sufficient extent to warrant operations on a large scale. These ores are of the usual brown ore type, and carry from 45 to 50 per cent. of iron and from 0.30 to 0.60 per cent. of phosphorus. It is also a fact that they can be mined cheaply, and that washing would, for the most part, not have to be resorted to. It is also a fact that these ores have been and are now used for the production of charcoal iron, and the total output of such iron from 1872 to the end of 1900 was 120,438 tons. Pardon me, but it is also the fact that this iron has an excellent reputation and buyers of charcoal iron are anxious to get it. And yet the industry languishes. Why it languishes is too long a story now. As this is not a discourse on the diseases of the iron business, we will forbear.

In an instructive paper read before the American Institute of Mining Engineers, Virginia Beach meeting, 1894, Wm. Kennedy, an engineer resident in Texas and familiar with the East Texas iron ore belt, took occasion to say that the probable cost of the production of charcoal iron in East Texas was \$12.01, which, in a postscript subsequently added, he reduced to \$9.50. The testimony that was given before a Committee of Inquiry, Twenty-seventh Legislature of Texas, 1901, was to some extent confirmatory of this lower cost. Mr. Kennedy's items of cost were as follows:

Cost of Making a Ton of Charcoal Iron in East Texas.

2½ tons of ore, at 82 cents.....	\$2.05
110 bushels of charcoal, at 4 cents.....	4.40
½ ton of limestone, at \$1.50.....	.75
Labor and salaries.....	1.50
Interest.....	.30
Repairs and incidentals.....	.50
Total.....	\$9.50

I think that this would probably represent the lowest cost, and that the average cost would be nearer \$11 than \$9.50, under present conditions. It is only in East Texas that pig iron has been made, and the only ores that have come into use are the limonites of that region.

The hematites and magnetites of Llano County, in Central Texas, 100 miles northwest of Austin, represent the best types of these ores. Some recent analyses of samples taken in person are as follows:

Analyses of Llano County Magnetite.—O. H. Palm and S. H. Worrell.

	Per cent.	Per cent.	Per cent.
Metallic iron.....	66.33	64.40	64.40
Silica.....	2.38	6.52	6.54
Alumina.....	2.69	trace.	trace.
Lime.....	none.	none.	none.
Magnesia.....	none.	none.	none.
Sulphur.....	0.44	trace.	trace.
Phosphorus.....	0.032	0.048	0.045

These ores were fully discussed by Theodore B. Comstock in the first and second annual reports of the Geological Survey of Texas, 1889 and 1890, and there is but little to add to what was said then. Few or no other developments have been made, and the matter stands now

just where it did then, in so far as concerns our knowledge of the extent of the deposits. The average of five analyses of Llano County magnetites given by Dr. Comstock is as follows:

Average Composition of Llano County Magnetites.—Analyses by J. H. Herndon and L. Magnenat.

	Per cent.
Metallic iron.....	63.31
Silica.....	4.67
Alumina.....	5.74
Lime.....	0.57
Magnesia.....	trace.
Sulphur.....	0.092
Phosphorus.....	0.064

With respect to phosphorus it must be said that of the five analyses quoted three showed a trace, one showed 0.02 per cent., and the other 1.02 per cent. Excluding this last as abnormal, we would have a very small amount of phosphorus in these ores. And yet these analyses clearly indicate that, while ores extremely low in phosphorus are to be found in this region, there is a possibility of their carrying more than the Bessemer limit of this element. The ores would be subject to rigid inspection and analysis if sold as Bessemer ores.

The average of six analyses of Llano County hematites, given by Dr. Comstock, is as follows:

Average Composition of Llano County Hematites.—Analyses by J. H. Herndon and L. Magnenat.

	Per cent.
Metallic iron.....	56.43
Silica.....	5.59
Alumina.....	7.86
Lime.....	1.44
Magnesia.....	trace.
Phosphorus.....	0.55
Sulphur.....	0.091

It is to be noted that in one of the samples there was 3.12 per cent. of phosphorus, corresponding to 7.16 per cent. of phosphoric acid. This is a most unusual amount of phosphorus in ore of this character. On the other hand, two of the samples showed a trace of phosphorus. The alumina is high, one of the samples giving 17.11 per cent., another 14.50 per cent., the average running to 7.86 per cent.

There are other parts of the central mineral region that yield good magnetites and hematites, as the counties of Gillespie, Mason, McCollough, &c.

In Llano County considerable prospecting was carried on 10 or 12 years ago, at Bessemer, 9 miles east of the town of Llano, and at Iron Mountain, 15 miles northwest of Llano, on the magnetites of these localities. South of Iron Mountain a diamond drill hole was carried down to a depth of 600 feet, with the following reported section to 517 feet:

Section of Bore Hole, South of Iron Mountain, Llano County.

	Feet.
Granite.....	301
Magnetic ore.....	40
Granite.....	25
No core, but thought to be ore.....	13
Granite.....	27
Chloritic rock and granite.....	36
Magnetic ore.....	7
Granite and schist.....	13
Granite.....	55
Total.....	517

An analysis of the ore from this property was made by Andrew McCreath, Harrisburg, Pa., with the following results:

Analysis of Ore from Bader Mine, South of Iron Mountain, Llano County.

	Per cent.
Metallic iron.....	64.15
Silica.....	7.28
Titanic acid.....	0.38
Phosphorus.....	0.014

Attractive as are some of the iron ores of this region, from a chemical standpoint, it cannot be said that they have been sufficiently prospected to enable one to speak with confidence of their extent. In places they seem to be of commercial importance, and at one time it was hoped that they would be mined. But the enterprise fell through, and the machinery that had been installed was removed. For several years nothing has been done.

The Fuel Problem.

Of late, however, there has been a revival of interest in these ores, as well as in those of East Texas. It was

* A paper read before the Engineers' Society of Western Pennsylvania.

stated that, so far as known, there were no deposits of coking coal in Texas. This statement applies to such coal as is now mined and to the ordinary beehive coke oven. But it is well known that some coals which do not yield good coke in a beehive oven do yield a fair coke in a recovery oven, such as the Solvay, the Hoffman, the Carves, the Huessener, &c. We are no longer restricted to the use of the beehive oven, for the improvements in the so-called recovery ovens now allow the use of an inferior coal for coking. I do not mean to say that the coke is as good as it would have been if better coal were used, but that it can be successfully used in the blast furnace. In other words, we can now make passably good coke from coal that would have been considered entirely unsuited for the purpose a few years ago. This fact has an important bearing on the utilization of the Llano County ores. A study of the map of Texas will show that the shortest route from the town of Llano to the producing coal fields, we will say to Strawn, in Palo Pinto County, is 347 miles. If coke were made in Palo Pinto, Erath, Eastland or Stephens, it would have to be hauled 350 miles to the ore, or the ore hauled 350 miles to the coke. But there will be built this year a connection between the Houston & Texas Central Railway, at Burnet, to the Gulf, Colorado & Santa Fé Railway, at Lampasas, 30 miles, that will reduce this distance to 280 miles, a gain of 70 miles.

Furthermore, it is not improbable that among the undeveloped coals of Stephens County, north of the Texas & Pacific Railway, at Bangor, there may be found some more suitable for coking than those already opened in that part of the carboniferous area. To open the Stephens County coal would require from 20 to 30 miles of road, so that we may say that the distance from the Llano ore fields to the coal fields, even after the completion of the Burnet-Lampasas branch, will be about 300 miles. It has been proposed to use the Llano County ores in furnaces already built, mixing them with the brown ores spoken of. The distance from Llano to the nearest blast furnace—viz., at Rusk—is 293 miles (the New Birmingham furnace is near Rusk), while to the furnace at Jefferson, Marion County, it is 370 miles. It is about the same distance from Llano to the nearest furnace as from Llano to the coal fields, and if Llano ore should be hauled to Rusk, New Birmingham or Jefferson it would have to be turned into charcoal iron, for the furnaces in East Texas are not built for coke iron.

But it has also been proposed to bring Indian Territory coke into the East Texas ore district. This would necessitate an all rail haul of 270 miles to Jefferson, and also to Rusk and New Birmingham. The East Texas ore fields are about 270 miles from South McAlester. So far as our present knowledge goes, we can say, therefore, that the shortest haul between the Texas iron ore districts and coking coal is 270 miles. If coking coal should be discovered in the Texas carboniferous the haul to the Llano ore district would be 300 miles, and to the East Texas ore district about the same. The Indian Territory coke would have an advantage of 30 miles as against Texas coke in the East Texas ore fields, but Texas coke—supposing, for the moment, that we had Texas coke—would have an advantage of 180 miles in the Llano ore district. Now, a 30-mile haul, in a total distance of nearly 300 miles, cuts but a slight figure, so we say that, if coking coal can be developed in the Texas carboniferous, it would compete on equal terms with Indian Territory coke in East Texas, and would have a decided advantage in the Llano district.

Shipping Llano Ores.

It has also been proposed to export the Llano ores, by way of Galveston, to Baltimore, or Philadelphia, or even across the Atlantic. From Llano to Galveston is 319 miles, but little more than from Llano to the coal fields. Whether Llano ore can find a market in this way remains to be seen. The distance from Galveston to Baltimore is 1800 nautical miles (making the total distance from Llano to Baltimore 2390 statute miles), while the distance from Santiago de Cuba or Daiquiri (large ore exporting ports on the southeast coast of Cuba) to Baltimore is 1300 nautical miles. It would re-

quire an ore of exceptional purity and of guaranteed composition to compete successfully with Jurugua or Spanish-American ore in markets already familiar with Cuban ore. The duty of 40 cents per ton on imported ore plays no great part in this matter, for it is rebated if the materials manufactured from it are in turn exported.

Still another plan has been suggested of late, and that is to ship Llano ore to Missouri furnaces, or to the furnaces at East St. Louis, in Illinois. The distance from Llano to St. Louis is 918 miles, and it is to be supposed that the chief reason why this long all rail haul is considered at all is because of the uncertainties and delays attending the shipping of lake ores to these furnaces during the winter months. From St. Louis to Duluth is 884 miles, by way of Burlington, Cedar Rapids and St. Paul. From Duluth to Mountain Iron, the heart of the Mesaba range, is 72 miles, making the distance from St. Louis to Mountain Iron 958 miles, as against 918 miles from St. Louis to Llano. To some of the Old Range or Wisconsin mines from St. Louis it is not so far as to Duluth; probably ore could be laid down at St. Louis with a 750-mile haul. But, at any rate, the distance from St. Louis to available ore in the north is less than from St. Louis to the Llano ores, while the freight rates are also less. Of course, some lake ore is hauled by rail to points from 800 to 1000 miles distant, but the conditions seem to be such as would not readily maintain were the attempt made to ship Llano ore as far as this by rail. The enormous output of the lake mines, the regularity of the car supply and other industrial factors outweigh the shortage due to occasional blizzards and seasons of very cold weather.

The Consumption of Iron in Texas.

What demand is there in Texas for pig iron, or bar iron, or rolled shapes of iron or steel? This question cannot be answered definitely, because there is no practical way of collecting the actual statistics. We know, of course, that Texas is an agricultural and grazing State, for the most part, and that industries other than agriculture which require large quantities of iron and steel have not yet been developed. The farming industry in Texas is certainly very large, and steadily growing larger. It requires a great deal of iron and steel, taking one year with another, and these supplies are furnished almost entirely from beyond State limits. The population of the State is increasing rapidly, having gained 36 per cent. between 1890 and 1900, leading all the Southern States. It is now 3,048,710. The railroad mileage, June 30, 1901, was 10,153 miles. There are now about 60 foundries in the State, and possibly half a dozen good machine shops, excluding those owned and operated by the railroads. I made the attempt to gather certain data from the foundries, and to this end sent out a letter to each one asking replies to the following question:

1. Where do you get your pig iron?
2. What kind of pig iron do you use?
3. What class of castings do you produce?
4. What is your daily capacity in tons?

Replies were received from 40 establishments, representing more than 95 per cent. of the foundry business in Texas. The replies to the first question show that the pig iron used comes from Texas, Alabama, Tennessee, Georgia and Ohio. There were seven that used Texas iron exclusively and three that used Texas iron in conjunction with Alabama iron. One firm write: "We get our pig from Alabama, but would prefer Texas iron if we could get it." Another, and a large and important establishment, writes: "We beg to say that for several years past, not being able to get a supply of Texas pig iron, which we much prefer to any other brand for use in our business, we have been forced to use pig iron made in Alabama and Georgia." A large consumer of pig iron in the Central West said to the writer recently that he had endeavored to secure a three-year contract for Texas iron, but had been unsuccessful because of the alleged inability to supply the amount desired. Of the establishments replying, 18 used Alabama pig exclusively, while 11 used Alabama pig in connection with pig from other States. It appears that Alabama iron is used more

extensively in Texas than any other kind. The kinds of pig iron brought here are, of course, Nos. 1 and 2 soft, and the regular foundry grades, even as low as No. 4 foundry, which is sometimes known as foundry forge.

The class of material turned out includes machinery and architectural work, engine and mill castings, farming implements, light steel castings used in plows (one establishment), railroad, bridge, hydraulic oil press, in fact, nearly all kinds of castings. There is no malleable iron plant in the State.

The daily capacity was 271 tons, distributed among 36 establishments. Most of the establishments, however, are small, eight of them accounting for 190 tons, leaving 81 tons for 28 plants. Three of the establishments report a total daily capacity of 135 tons, these three having 25, 50 and 60 tons, respectively. Not all of the total daily capacity of 271 tons is to be considered as pig iron, for a considerable amount of scrap is used, the exact proportion not being known, depending, as it does, upon the kinds of castings required, &c. Perhaps one would be safe in assuming that one-half of the total daily capacity represents the pig iron used, in which case we would have 135 tons. I think it would be safe to assume 100 tons a day as the average consumption of pig iron, as such, in Texas, or 30,000 tons a year.

Of the consumption of pig iron in manufactured form there are no statistics, but we may arrive at a practical conception through the weight of the cotton ties used in bagging the crop of 1900. This was about 13,500 tons, worth \$1,500,000. The average cost of the ties is 50 cents per bale, and the crop of 1900 was in excess of 3,000,000 bales of 500 pounds each. Not allowing for any wastage between pig iron and cotton tie—although there is, of course, a considerable waste, utilized, however, in other ways—we have 43,500 tons of pig iron consumed annually by the Texas foundries and by the makers of cotton ties used in bagging the Texas cotton crop.

To this must be added the wire fencing, wire nails, jobbers' hardware, architectural, agricultural and railroad iron, &c., which would, I think, bring the total up to at least 60,000 tons a year, exclusive of steel rails, merchantable steel and malleable castings. In other words, the amount of iron made in Texas from 1872 to 1900, a period of 29 years, would just about supply the demand of two years, excluding rails, steel and malleable castings.

Now the question is, Can a considerable proportion of the pig iron used in Texas be made in Texas and from Texas materials? This is purely a business matter, and has nothing to do with sentiment. It is strictly a matter of dollars and cents, and must be regarded solely from this standpoint.

There is plenty of ore in the State and of a quality that is very largely used elsewhere; can it be utilized? Considering the fact that, so far as now known, there is no coking coal in the State, the manufacturers of pig iron must depend upon the use of charcoal as fuel, or upon coke brought in from the Indian Territory, the nearest source of supply, over a distance of 270 miles from the East Texas district, and 480 miles from the Llano district. The only native fuel is charcoal. Coking coal may be discovered and brought into use, but at the present time the only known fuel is charcoal, for lignite is not in the running.

There is an opportunity in East Texas for the production of charcoal iron, and a 50 or 60 ton furnace would probably do well there. The product would find a ready sale in Texas, for there are four foundries already in operation that would consume the entire product. As already remarked, the iron that has been made there has a good reputation and is in demand, specially by the makers of car wheels and plow castings. An output of 60 tons per day could readily be marketed at satisfactory prices. It is true that the charcoal and limestone would have to be hauled considerable distances, but even under these conditions it is not improbable that iron could be made for \$10. I am aware that the charcoal iron industry has been in a decadent condition for several years. But here is a territory that is to a large extent cut off from the great centers of iron production and yet uses 100 tons of pig iron a day for foundry purposes. The decadence of the charcoal iron industry

merely goes to show that coke iron has taken its place in certain districts and for certain purposes; it does not prove that it could not be established in Texas. The Texas iron trade is essentially a foundry trade and the largest establishments would be glad to get charcoal iron, and this is substantiated by numerous letters now in my possession.

Furthermore, a steel cotton tie and wire plant, making also small steel castings, would have a very large area within which to market its products. Of cotton ties alone the three States of Arkansas, Louisiana and Texas in 1900 used \$2,211,000 worth. It is impossible to speak positively of the wire trade, for there are no statistics available, but it is not unlikely that it is worth, in these three States, \$500,000, making a total for cotton ties and wire of \$2,711,000.

Oil as Fuel.

A charcoal furnace for foundry iron and a coke furnace for iron destined for the steel plant, pipe, &c., would probably be an advisable combination. Beaumont oil or Corsicana residuum could be used for fuel in the steel furnace, as also in the foundry, and could be delivered within the iron ore district of East Texas for 40 cents per barrel. The distance from Beaumont to Rusk is 158 miles, and from Corsicana to Rusk 120 miles, from Beaumont to Jefferson 262 miles, and from Corsicana to Jefferson 158 miles. Recent contracts for the delivery of the Beaumont oil within distances varying from 250 to 300 miles have been made at 44¼ cents per barrel. The Nacogdoches oil field (not, however, producing now) is within 80 miles of Rusk, and 148 miles of Jefferson, so that the estimate of 40 cents a barrel for Beaumont oil in the ore district is certainly not too high, and it is likely that it could be delivered for a price considerably below this. At 40 cents a barrel and four barrels per ton of coal we would have \$1.60 as the price of oil equivalent to a ton of coal. It is to be observed, of course, that the oil is for use only in the puddling furnaces, in the steel furnaces, or in foundries (for core ovens, &c.). It cannot be used alone, or in admixture with lignite, as a blast furnace fuel. I would not tax your patience with this statement were it not for the fact that I have received letters of inquiry on this very point. There seems to be a belief in certain quarters that crude oil can be used in the blast furnace in place of coke or charcoal, but this belief is not shared by those who are familiar with the requirements for blast furnace fuel. As you know, it takes a good deal more than mere heating power to supply the demands of a blast furnace. Crude oil is valuable for many purposes, but the time has not yet come when it can supplant solid fuel for iron making. Coke, anthracite coal, splint coal and charcoal will continue to be used long after we have passed away.

From an examination of all known facts and reasonable deductions therefrom, I think it probable that iron making could be established in Texas on a commercial scale and with fair prospect of success. There is nothing like enough iron produced in the State to supply the present demand, the State is growing rapidly and many industries are springing up, consequent, among other causes, upon the discovery of large stores of cheap fuel oil.

Within 175 miles of Rusk and in Texas alone there is a daily capacity of the foundries in excess of 225 tons, pig iron and scrap, of which about one-half is pig iron. Within a distance but little further from Jefferson the same statement holds good. The ore fields of East Texas are within 200 miles of the most densely populated region in the State, and one that is increasing in wealth and in iron consuming power every year. It is true that the East Texas iron ores are not of a high grade, but they are of as good a quality as brown ores generally, and in the country at large there were mined in 1900 3,231,089 tons of ore of no better quality. The lowest average value per ton of ore in 1900 was reported from this State 82 cents a ton. This may have been due to the fact that convict labor is employed, but experience elsewhere has shown that convict mined ore and coal are but little, if any, cheaper than the coal and ore mined with free labor. The main benefit derived from the use of convict labor is, perhaps, due to the uninter-

rupted control of it, not to any marked decrease in the cost of production aside from this fact.

There are four furnaces in Texas now, all of them built for charcoal, and all of them in the East Texas district. These are as follows:

Jefferson Furnace, Jefferson, Marion County. One stack, 60 x 12, built in 1889-1891, blown in March 15, 1891. Two Durham iron stoves. Capacity, 13,500 tons. A rolling mill was partly finished in 1891, and was designed to contain 15 single puddling furnaces, three heating furnaces and three trains of rolls (one 18-inch muck and one 8 inch and one 12-inch bar).

Old Alcalde Furnace, Rusk, Cherokee County, owned by the State of Texas. One stack, 55 x 9½. Built in 1883, and put in blast February 27, 1884. Hot blast. Capacity, 7000 tons. A pipe foundry is connected with the furnace.

Star and Crescent Furnace, near Rusk, Cherokee County. One stack, 65 x 11. Built in 1890-1891, and blown in November, 1891. Iron stoves. Capacity, 18,000 tons.

Tassie Bell Furnace, New Birmingham, Cherokee County. One stack, 60 x 11. Built in 1889-1890, and blown in November, 1890. Two Weimer pipe stoves. Capacity, 13,500 tons.

During the last ten years, therefore, there have been four charcoal furnaces capable of making iron, with a total annual capacity of 52,000 tons. But during this period—i. e., from 1891 to 1900, inclusive, the total amount of iron made was only 71,412 tons. With a total capacity during these ten years of 520,000 tons, the actual output was 71,412 tons, or 13.7 per cent. of the capacity. We have the statistics of the production of pig iron in Texas since 1872, with the exception of two years, 1875 and 1878, when the output may have been 500 tons each. The total amount of pig iron produced during these 29 years, 1872-1900, inclusive, was 120,438 tons. As already remarked, this is about enough to supply the demand for four years, while the furnaces in the State could produce it in 28 months.

We have not considered other deposits of iron ore in the State, as, for instance, in El Paso County, west of the Pecos River. But little is known of them, although some excellent samples have been received. Some of the El Paso ores closely resemble the Llano magnetites. They lie at some distance from rail, and may not be available. They occur in the Quitman Mountains, the Sierra Diabolo, Sierra Carrizo and Chinatti. In the Quitman Mountains, according to Von Streeuwitz, carbonate of iron is also found.

In Gonzales and Caldwell counties, near Harwood, on the Southern Pacific Railway, 64 miles east of San Antonio, there are beds of limonite of good quality.

In this paper the attempt has been made to consider the iron resources of the State in a general way, without inquiring into the merits of any particular deposit of ore or of any special location. The conclusions reached are as follows:

Conclusions.

1. There are extensive deposits of limonite in East and Northeast Texas, carrying from 45 to 50 per cent. of iron, but not suited for the manufacture of Bessemer iron. These ores can be cheaply mined, and can be delivered to the furnace for 80 cents to \$1 a ton.

2. There are deposits of magnetic and hematite ores in Llano, Mason, Gillespie, &c., of unknown extent, but of excellent quality.

3. The only available fuel is charcoal, unless Indian Territory coke can be brought in.

4. The total daily capacity of the foundries in the State is 271 tons, pig iron and scrap, of which at least 100 tons is pig iron.

5. There is an active and steady demand for Texas iron, and there would be little difficulty in marketing 100 tons a day within a distance of 150 to 200 miles.

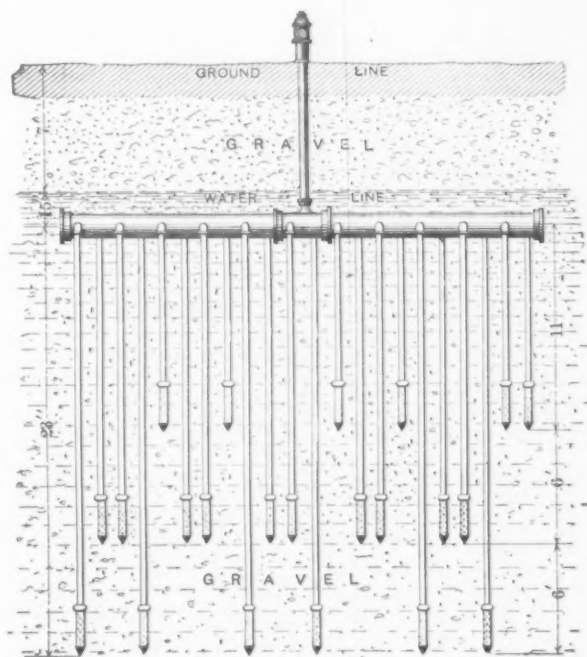
6. The demand for pig iron, as such, is about 30,000 tons a year. Cotton ties call for 13,500 tons more, while wire fencing, wire nails, &c., would probably call for 16,500 tons. Exclusive of steel rails, merchantable steel and malleable castings, the consumption of iron, taken as pig iron, is probably about 60,000 tons a year.

7. The annual average production of pig iron in the State during the ten years 1891-1900 is 7141 tons, leaving 23,000 tons to be brought in from other States.

8. The cost of producing charcoal iron in East Texas should not exceed \$11, and may be reduced to \$10. On account of the long haul for coke, it is not likely that the cost of coke iron would be much less than that of charcoal iron.

Driven Wells for Fire Purposes.

Janesville, Wis., has a driven well for fire purposes which has proven to be a great improvement on cisterns. It consists of two 12-inch water pipes connected so as to



Driven Wells for Fire Purposes.—Fig. 1.—Elevation Showing Feeders, Main and Service Pipes.

extend in a line and a 5-inch wrought iron pipe all connected to a central T, the wrought iron pipe extending to the surface, as shown in the elevation given in Fig. 1, and on both sides of the water main, or reservoir, points put down at irregular depths, from 10 to 20 feet. The points are driven from 4 to 6 feet from the main, as shown in Fig. 2, which is a plan and in line with the nipple to which they have to be coupled.

Before laying the apparatus the earth should be ex-

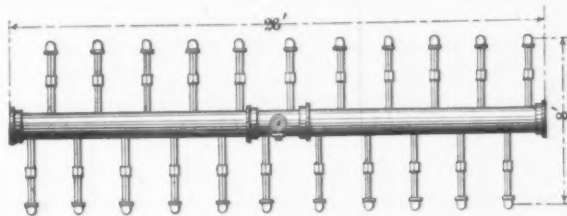


Fig. 2.—Plan Showing Location of Feeders.

cavated to the level of the water, where the excavation should be not less than 28 feet long by 14 feet wide. This kind of water supply, says *Municipal Engineering*, cannot be obtained in all localities. The water line must be within reach of the suction of the engine, and the points, no matter how deep they are, must rest in a gravel formation. The placing of the 12-inch water pipe, to which the points are all connected 2 feet below the water line, gives a free flow of water in the pipe under an 18-inch head, faster than any steam fire engine can take it out.

National Metal Trades Association

Fourth Annual Convention.

In last week's issue the proceedings of the first day of the fourth annual convention of the National Metal Trades Association, at Cincinnati, were presented. The convention continued in session on Wednesday, 9th inst., concluding its labors on the evening of that day. Following is a list of those in attendance:

Members.

Geo. F. Steedman, Curtis & Co. Mfg. Company, St. Louis, Mo.
 E. C. Lufkin, Snow Steam Pump Works, Buffalo, N. Y.
 E. F. Du Brul, Miller, Du Brul & Peters Mfg. Company, Cincinnati.
 H. N. Covell, Lidgerwood Mfg. Company, Brooklyn, N. Y.
 Victor H. Olmsted, commissioner and secretary, 95 Liberty street, New York.
 E. J. Mercer, N. M. T. A., New York.
 Walter Laidlaw, Laidlaw-Dunn-Gordon Company, Cincinnati.
 James C. Hobart, Triumph Electric Company, Cincinnati.
 H. M. Norris, Bickford Drill & Tool Company, Cincinnati.
 Robt. B. McGowan, John McGowan Company, Cincinnati.
 Wm. Lodge, Lodge & Shipley Machine Tool Company, Cincinnati.
 Fred. A. Geler, Cincinnati Milling Machine Company, Cincinnati.
 S. P. Egan, J. A. Fay & Egan Company, Cincinnati.
 J. H. Day, the J. H. Day Company, Cincinnati.
 Henry Korb, Greaves, Klusman & Co., Cincinnati.
 Wm. Greaves, Greaves, Klusman & Co., Cincinnati.
 Wm. N. Hobart, Triumph Electric Company, Cincinnati.
 H. C. Hoefinghoff, Bickford Drill & Tool Company, Cincinnati.
 John Kirby, Jr., Dayton Mfg. Company, Dayton, Ohio.
 M. H. Barker, American Tool & Machine Company, Boston, Mass.
 L. E. Thomas, Lloyd Booth Company, Youngstown, Ohio.
 M. A. Neeland, the Wm. Tod Company, Youngstown, Ohio.
 E. D. Church, Jackson & Church Company, Saginaw, Mich.
 D. J. Kilby, Kilby Mfg. Company, Cleveland, Ohio.
 D. G. Moore, the Samuel T. Moore & Sons Company, Elizabeth, N. J.
 Fred. F. Stockwell, Barbour-Stockwell Company, Cambridgeport, Mass.
 Henry F. Arnold, American Tool & Machine Company, Boston, Mass.
 P. B. Kendig, Seneca Falls Mfg. Company, Seneca Falls, N. Y.
 Thos. Livingston, Wm. R. Perrin Company, Chicago.
 N. B. Payne, Payne Company, Elmira, N. Y.
 W. D. Sayle, Cleveland Punch & Shear Company, Cleveland, Ohio.
 John S. Lewis, the Wm. Tod Company, Youngstown, Ohio.
 E. T. Gilbert, Michigan Bolt & Nut Works, Detroit, Mich.
 Theo. P. Byram, Byram & Co., Incorporated, Detroit, Mich.
 W. P. Egan, Fred W. Wolf Company, Chicago.
 Exile Burkitt, Southern Engine & Boiler Works, Jackson, Tenn.
 W. A. Evans, Commercial Electric Company, Indianapolis, Ind.
 C. F. Wieland, Kampsmitth Mfg. Company, Milwaukee, Wis.
 Thos. E. Durban, Erie City Iron Works, Erie, Pa.
 Geo. M. Jackson, Springfield Mfg. Company, Bridgeport, Conn.
 Benj. Sebastian, Sebastian Lathe Company, Cincinnati.
 F. H. Strong, Eaton, Cole & Burnham Company, Bridgeport, Conn.
 Jacob May, Sebastian Lathe Company, Cincinnati.
 E. H. Bullard, Bullard Machine Tool Company, Bridgeport, Conn.
 T. J. Neacey, the Flier & Stowell Company, Milwaukee, Wis.
 Sam'l L. Moyer, the Lunkenheimer Company, Cincinnati.
 S. L. Hadley, Commercial Electric Company, Indianapolis, Ind.
 J. J. Walser, Goss Printing Press Company, Chicago.
 E. E. Greenwald, the I. & E. Greenwald Company, Cincinnati.
 H. G. Fleber, Medart Patent Pulley Company, St. Louis.
 O. B. Kinnard, Kinnard-Haines Company, Minneapolis, Minn.
 Alex. Adams, Twin City Iron Works, Minneapolis, Minn.
 Oliver Crosby, Moore Carving Machine Company, Minneapolis, Minn.
 Geo. W. Krapp, American Fire Engine Company, Cincinnati.
 E. J. Kimball, Globe Iron Works, Minneapolis, Minn.
 Frederick K. Copeland, Sullivan Machinery Company, Chicago.
 H. E. Goodman, Goodman Mfg. Company, Chicago.
 James Weir, Weir & Craig Company, Chicago.
 P. K. Morcom, Colorado Iron Works Company, Denver, Col.
 S. W. Watkins, Christensen Engineering Company, Milwaukee, Wis.
 H. F. Devens, National Cash Register Company, Dayton, Ohio.
 Enoch Earle, P. Blaisdell Company, Worcester, Mass.
 R. H. Jeffrey, Jeffrey Mfg. Company, Columbus, Ohio.
 J. W. Gardner, Gardner Governor Company, Quincy, Ill.
 Howard P. Eells, the Bucyrus Company, South Milwaukee, Wis.
 William H. Speer, Jr., Dayton Mfg. Company, Dayton, Ohio.
 J. H. Whiting, Whiting Foundry Equipment Company, Harvey, Ill.
 F. D. Wanning, Birmingham Iron Foundry Company, Derby, Conn.
 F. W. Boye, Jr., Schumacher & Boye Cincinnati.
 Sam'l J. Watson, Watson Machine Company, Paterson, N. J.
 E. A. Schumacher, Schumacher & Boye, Cincinnati.
 A. C. Pessano, Geo. V. Cresson Company, Philadelphia.
 J. A. Seymour, McIntosh-Seymour Company, Auburn, N. Y.
 F. H. Stillman, the Watson-Stillman Company, New York.
 M. D. Knowlton, Knowlton & Beach Company, Rochester, N. Y.
 U. F. Frohman, Whiting Foundry Equipment Company, Cincinnati.

G. A. Mayer, Cincinnati Milling Machine Company, Cincinnati.
 David C. Jones, the Lunkenheimer Company, Cincinnati.
 Napoleon Du Brul, the Miller, Du Brul & Peters Company, Cincinnati.
 Fred. Holz, Cincinnati Milling Machine Company, Cincinnati.
 H. Ritter, the Lunkenheimer Company, Cincinnati.
 D. P. Hopkins, U. S. Cast Iron Pipe & Foundry Company, Addyston, Ohio.

Guests.

F. A. Halsey, *American Machinist*, New York.
 John W. Nell, the John H. McGowan Company, Cincinnati.
 James M. Curran, James H. Curran Elevator Company, Cincinnati.
 Daniel Huguenin, Chicago Metal Trades Association, Chicago.
 James H. Curran, James H. Curran Elevator Company, Cincinnati.
 Geo. W. Cope, *The Iron Age*, Chicago.
 A. J. Findley, *Iron Trade Review*, Cleveland, Ohio.
 A. C. Marshall, the Employers' Association, Dayton, Ohio.
 H. M. Lane, the Lane & Bodley Company, Cincinnati.
 E. H. Hargrave, Cincinnati Tool Company, Norwood, Ohio.
 W. R. Wallis, *American Machinist*, New York.
 Alfred Marshall, Marshall & Huschart Machinery Company, Chicago.
 Geo. W. Otting, John Steptoe & Co., Cincinnati.
 H. M. Moore, Cincinnati Punch & Shear Company, Cincinnati.
 John A. Penton, Detroit, Mich.
 Geo. F. Stewart, Bradford Machine Tool Company, Cincinnati.
 W. T. S. Johnson, Bradford Machine Tool Company, Cincinnati.
 Philip Fosdick, the Fosdick & Holloway Machine Tool Company, Cincinnati.
 W. S. Norris, the Lane & Bodley Company, Cincinnati.
 P. G. March, Cincinnati Shaper Company, Cincinnati.
 B. B. Quillan, Cincinnati Planer Company, Cincinnati.
 W. H. Burtner, Cincinnati Planer Company, Cincinnati.
 Chas. F. Dolle, National Machine Tool Company, Cincinnati.
 Aug. H. Tuechter, Cincinnati Machine Tool Company, Cincinnati.
 S. C. Schauer, Cincinnati Machine Tool Company, Cincinnati.
 H. Belmer, Belmer-Eames Tool Company, Cincinnati.
 W. B. Bogardus, National Portland Cement Company, Toronto, Ont.
 J. M. Robinson, the J. M. Robinson Mfg. Company, Cincinnati.
 Wm. E. Gang, the Wm. E. Gang Company, Cincinnati.
 J. H. Smith, Corporations Auxiliary Company, Cleveland, Ohio.
 F. G. Bolles, Bullock Electric Mfg. Company, Norwood, Ohio.
 D. J. Redding, Pittsburgh & Lake Erie Railroad Company, Pittsburgh, Pa.
 James E. Brady, the J. H. McGowan Company, Cincinnati.
 Robert I. Clegg, *Iron Trade Review*, Cleveland.
 E. T. Hannah, Erie City Iron Works, Cincinnati.
 J. B. Doan, American Tool Works Company, Cincinnati.
 J. W. Cregar, Philadelphia.

Wednesday Morning Session.

Some very important questions having been brought up for consideration, President Steedman announced that it had been thought desirable to increase the Committee on Resolutions, and he therefore appointed the following additional members: John Kirby, Jr., of Dayton, O. B. Kinnard of Minneapolis and F. H. Stillman of New York.

The report of the Committee on Reorganization of the Association was laid before the convention. This was a proposition to change the constitution and by-laws to more fully meet conditions which had developed during the strike of last year. The experience thus acquired had been of great practical benefit in demonstrating how the association could be made more effective. E. F. Du Brul of Cincinnati, secretary of the committee, explained the plan which had been adopted, and read the proposed new constitution and by-laws, giving the reasons for the suggested changes. A protracted discussion followed which developed a division of opinion relative to the method of providing for membership in the association. Some contended for individual membership, while others strongly advocated a federation of local associations with delegate representation in a national organization.

Wednesday Afternoon Session.

The discussion of the proposed new constitution and by-laws was resumed, resulting in the Committee on Resolutions being instructed to prepare a resolution as speedily as possible providing for the further consideration of the subject by the Committee on Reorganization. They reported a resolution, which was adopted, providing for the continuance of the Committee on Reorganization, to which five more members are to be added by the chair. The committee are to meet in New York on May 5, and are instructed to prepare a plan of reorganization based on a federation of district or local associations to be represented in the national association by delegates chosen in proportion to the number of

men employed. Each district association is to make its own by-laws and to elect its own members.

Thomas E. Durban of Erie, Pa., read a paper on the "hour and wage" question, which opened up an interesting discussion.

The Auditing Committee's report, stating that the treasurer's accounts had been found correct, was presented by E. T. Gilbert of Detroit, chairman, and was adopted.

Wednesday Evening Session.

M. H. Barker of Boston, chairman of the Committee on Nominations, reported the following list of officers for the ensuing year

PRESIDENT, S. W. Watkins of Christensen Engineering Company, Milwaukee, Wis.

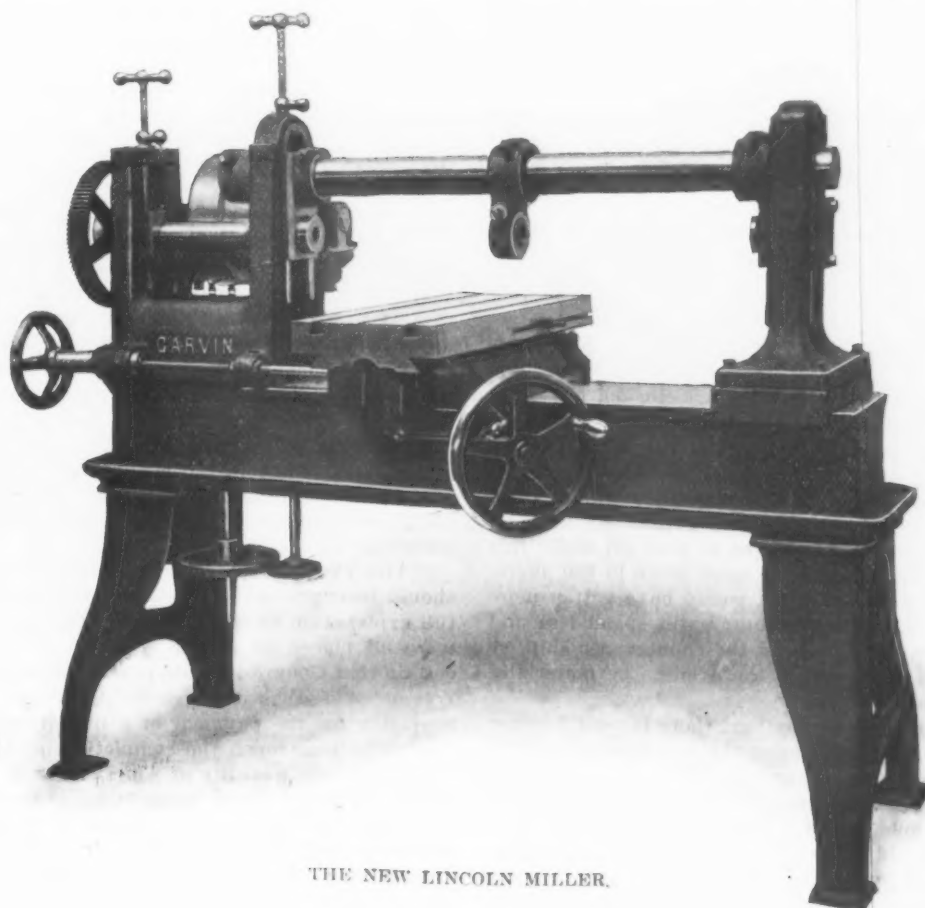
FIRST VICE-PRESIDENT, E. F. Du Brul of the Miller, Du Brul & Peters Mfg. Company, Cincinnati.

SECOND VICE-PRESIDENT, E. H. Bullard of the Bullard Machine Tool Company, Bridgeport, Conn.

TREASURER, N. B. Payne of the Payne Company, Elmira, N. Y.
COMMISSIONER AND SECRETARY, Victor H. Olmsted, 95 Liberty street, New York.

The New Lincoln Miller.

A Lincoln miller of new design has been brought out by the Garvin Machine Company of New York. In this the large table, arm and operating hand wheel have been brought close to the operator. The feed is thrown in and tripped by one handle at the front of the saddle. The feed is driven positively by chain, and the changes are provided by change gears. The feed works are located at the rear of the saddle and are thoroughly protected. The saddle is adjusted by hand wheel at the headstock end of the bed and the same screw is fitted with jam nuts to lock the saddle in position. The arm is a solid steel bar which adjusts with the spindle and is supported at both ends, tying the head and tail stocks together in one stiff whole. The tail stock is a strong frame construction which carries a bearing block having a running taper plug to receive the arbor, thereby affording a large bearing surface to take the pressure of the cutters and relieving the arbor of wear. An interme-



THE NEW LINCOLN MILLER.

The report was adopted without a dissenting vote, the secretary was instructed to cast a ballot for the entire list named, and all were declared elected.

The new president was escorted to the chair, and after speeches by himself and the other new officers called for the regular order of business.

H. N. Covell of the Lidgerwood Mfg. Company, Brooklyn, N. Y., was elected chairman of the second district, consisting of New York and New Jersey, to succeed N. B. Payne, elected treasurer.

George F. Steedman of the Curtis & Co. Mfg. Company, St. Louis, was elected a member of the administrative council from the seventh district, consisting of Missouri and Iowa.

Resolutions of thanks were adopted to the Cincinnati manufacturers for their hospitality, the retiring officers for their efficient service, &c.

After the adjournment on Wednesday evening the members and their guests repaired to the main dining room of the Grand Hotel and enjoyed a smoker, tendered them by the Cincinnati Metal Trades Association. Many remained in the city on Thursday for the purpose of visiting the Cincinnati shops, which were courteously thrown open for their inspection.

mediate support carrying a hardened and ground steel bush is also provided. The headstock has been much improved by the increased depth between the front and rear bearings.

Naked steam pipes are still quite common, to say nothing of boilers exposed to constant drafts wholly unprotected as to their shells. The loss of fuel by this neglect is very large, increasing with the size of the superficial areas, and very few steam users are aware of the expense entailed by uselessly heating the atmosphere. George H. Barrus lately tested the steam system at the Manhattan Railway power house in this city with the following results: A 2-inch steam pipe 100 feet long, under 80 pounds pressure, lost by condensation in pounds of water per hour when covered only 15.14 pounds, while uncovered the condensation was as a maximum 60.30 pounds of water; under 100 pounds of steam per square inch the greatest condensation was for the same pipe 72.20 pounds. A 10-inch pipe 35 feet long under 100 pounds pressure, naked, lost, maximum, 112 pounds of water per hour by condensation; when covered this was reduced to 15.93 pounds as a maximum.

The temperature of the room where the experiment took place was 50 to 75 degrees F. Comment seems unnecessary.

The Shipbuilding Bill.

Testimony Before the House Committee on Merchant Marine and Fisheries.

WASHINGTON, D. C., April 15, 1902.—The House Committee on the Merchant Marine and Fisheries has taken up the shipping bill recently passed by the Senate, and has begun a series of hearings which will last for several weeks, and will give both the advocates and opponents of this important measure full opportunity to state their views with regard to it. At the first hearing, which was held on the 10th inst., the committee heard Thomas Clyde of William P. Clyde & Co. and the Clyde Steamship Company; Alexander R. Smith, superintendent of the Maritime Association of the Port of New York, and Erastus Brainerd, representing the Seattle (Wash.) Chamber of Commerce. Mr. Clyde's statement was the principal feature of the hearing, and was devoted to an exhaustive analysis of the pending bill and its probable effect upon the American merchant marine. With regard to the rates of compensation provided in the bill brought forward in the last Congress and in the pending measure, Mr. Clyde said:

Testimony of W. P. Clyde.

"When the bill before this committee was under discussion in the Senate the suggestion was made that the ship owners of the country, having failed to get the rates of subsidy they asked for last year, have come back to Congress this year prepared to take less; and from this false assumption the conclusion has been drawn that if the ship owners shall fail to get what they ask for this year, they will come back another year prepared to take still less. There is absolutely no basis for such an assumption. The individual ship owner could not, on the average, have gotten any more, if as much, under last year's bill as he may get under this bill. The country would have spent more in the aggregate under last year's bill, but would have gotten more ships. Under this bill the country will spend less and get fewer ships. The price to the country per ship, or per ton of ships, will not on the average be materially different in either case.

"There are those who say that there is no difference between the cost of performing the service required under the American flag as compared with a foreign flag. Very well; what then? Simply this: The whole amount appropriated would be a gift to the American ship owners, and as the old bill provided for a pro rata distribution of the appropriation in case more than a certain number of ships sought to obtain the compensation, there would be a rush of capital and men into the business which would never stop until foreign flags were as rare on the sea as the American flag is to-day. Surely if this could be accomplished, even \$9,000,000 a year—the amount appropriated by the old bill—would not be too much to pay.

"Of course, this committee knows as well as I do that there is a material difference between the cost of performing the service required under the American flag as compared with foreign flags, and that we must start somewhere, and from the best information obtained fix the rate by which the Government will undertake to make good the difference to the American ship owner. Now we think from the best information we can get, leaving out the question of subsidies paid by foreign Governments, 1 cent per gross ton per 100 miles sailed would be about the right figure to represent the difference in cost of performing the required service."

Taking up the pending bill, Mr. Clyde analyzed its provisions, discussing first Title I, under which he said the cost of operating ships would regulate the bids on mail contracts. Continuing, he said:

"When the difference in cost is less, bids will be made at lower rates; and to assume the contrary you must assume either that Americans will not compete

with each other for profitable business, or that there will be criminal and culpable negligence on the part of the Postmaster General; and I am not willing to assent to either of these propositions.

"Now as to Title II of the bill: Will Congress make the test to learn whether American capitalists can be induced to go into the ship owning business? If you start at too low a rate of compensation you will have to come up, and if you start too high you will come down. But such a rich country as this will hardly hesitate longer at making the experiment. The cost of constructing vessels in the United States, as nearly as we can ascertain, is from 20 to 30 per cent. more than abroad, while operation is at least 30 per cent. more expensive. I hope when you come to debate this bill you will hold the opposition down to these two points, and refuse absolutely to let them lead you astray with their flights of fancy about 'trust magnates,' &c., and all that sort of hosh. Bring them back to the points, first, that there is difference in cost of construction and operation, and second, that there is no safer or simpler way than this of enabling the Government to make it good to the ship owner. If I am wrong, I don't want this bill or any other bill."

In connection with his statement that the cost of constructing vessels in the United States was 20 to 30 per cent. greater than abroad, Mr. Clyde gave an interesting explanation of the circumstances under which certain steamship companies placed orders for vessels with American shipyards a year or more ago. He said:

"We all know it to be a fact that since the Civil War the country has ceased to build ships for foreign trade, except in rare cases, where mail subsidies or a combination of protected coastwise and foreign voyages have made it possible for Americans to compete on comparatively even terms. There is, however, a notable exception to this statement. A year or more ago the International Navigation Company, the Pacific Mail Steamship Company and the Atlantic Transport Company all placed large orders in this country for vessels to be built here, presumably for foreign trade. These orders were all placed about the same time and none have been placed since.

"This exception is so extraordinary that it certainly should be explained to this committee, and a frank and full explanation should be made. The orders mentioned were all placed at a time when it seemed practically certain that Congress would pass a bill admitting a large volume of foreign tonnage to American registry and providing for the payment of a liberal subsidy to such foreign tonnage upon the completion in this country of a proportionate quantity of American built ships. Each of the companies I have named were at that time owners of foreign tonnage; and they placed their orders for their new ships in this country primarily to discount the passage of that bill, in order to have their compensating tonnage finished at the earliest possible date and so get the subsidy on their foreign tonnage without delay. They were 'early birds'—that is all—and I don't see why their action should have any bearing whatever upon the present situation of this subject. They took what they considered to be a fair chance. So far they have been disappointed; but the country has been benefited by the large sums of money expended here instead of abroad in the construction of these great ships."

The Outlook in the House.

No prediction can be ventured at this time as to whether the shipping bill will be passed by the House at the present session, for the reason that other considerations than the strength of the measure on an actual vote are likely to control the situation. Certain of the majority leaders in both Houses doubt the expediency of passing the bill before the Congressional elections, and it may therefore be placed on the calendar and permitted to go over until next winter. Another consideration may make it difficult to secure a report upon the bill in time to have it acted upon at the present session. This is the attitude of four Republican members of the committee—Minor of Wisconsin, Stevens of Minnesota, Jones of Washington and Fordney of Michigan. These members have always been lukewarm in the support of the

general proposition of subsidizing the merchant marine, and only consented to permit the bill to be reported in the last Congress, after incorporating therein several elaborately constructed "antitrust" amendments. They are opposed to the pending bill on general principles, and in addition are disposed to hold the measure in committee in the hope of inducing the advocates of Cuban reciprocity to abandon their programme in order to secure a vote on the shipping bill.

W. L. C.

Notes from Great Britain.

The Naval Contracts.

LONDON, April 5, 1902.—The long looked for and anxiously awaited naval contracts are at last announced. Nineteen vessels are ordered, and the Clyde has secured a very big proportion, in the shape of one battle ship and four first-class cruisers. The work has been divided out geographically, and I subjoin the net result. It may be taken that the battle ships are worth from £560,000 to £575,000. This only includes the work actually to be done at the shipbuilders' establishments, and does not take into account the armor—which is a very heavy item—guns, gun mounting and stores, the total estimated cost when completed for war service being figured out at £1,300,000. The shipbuilders' work on cruisers amounts to from £500,000 to £530,000, and the armor, guns, &c., bring the total cost to about £1,000,000. The third class cruisers each represent £200,000, exclusive of the guns, and the torpedo boat destroyers at about £70,000. In all the value of the naval contracts given out in this batch will amount to about £25,000,000, exclusive of guns, armor, &c. The geographical distribution of the contracts may be set out as follows:

Clyde Portion, Equal to £2,670,000.
 Battle ship—Fairfield Company.
 First-class cruiser—W. Beardmore & Co.
 First-class cruiser—London & Glasgow Company.
 First-class cruiser—Messrs. Scott & Co.
 Tyne Portion, Equal to £1,000,000.
 First-class cruiser—Sir W. G. Armstrong, Whitworth & Co.
 Third-class cruiser—Sir W. G. Armstrong, Whitworth & Co.
 Two torpedo boat destroyers—Palmer's Company.
 Two torpedo boat destroyers—Hawthorn, Leslie & Co.
 Barrow Portion, Equal to £530,000.
 Battle ship—Vickers, Sons & Maxim, Limited.
 Mersey Portion, Equal to £410,000.
 Third-class cruiser—Laird Brothers, Limited.
 Three torpedo boat destroyers—Laird Brothers.
 Thames Portion, Equal to £360,000.
 Engines for H. M. S. "King Edward VII."—Thames Iron Works.
 Three torpedo boat destroyers—Yarrow & Co.

The Railway Rolling Stock Combine.

I hinted some time ago that a number of firms interested in the manufacture of railway rolling stock were about to combine. The combination is now practically an accomplished fact. The five companies concerned are the Ashbury Railway Carriage & Iron Company, Brown, Marshalls & Co., the Lancaster Railway Carriage & Wagon Company, the Oldbury Railway Carriage & Wagon Company and the Metropolitan Railway Carriage & Wagon Company. The new combination will, for the future, be known as the Metropolitan Amalgamated Railway Carriage & Wagon Company, Limited. The subscribed capital will be £1,500,000 in £1 shares, of which £500,000 will be cumulative preference and the remainder ordinary shares. The actual paid up capital will amount only to £864,000. This figure may be slightly modified, as the Ashbury Company have the option of taking 5 per cent. preference shares in lieu of ordinary if they think proper, to the value at par of their paid up capital. The preference shares are divided into two kinds—viz., 60,000 carrying interest at 6 per cent. to specify the existing rates of preference holders in the Oldbury Company, and the remainder in 5 per cent. shares. The debentures on the combined companies amount in all to £107,250, and these will be paid off. In every case the business of the contracting companies is taken over as from the end of their last financial year, and dividends at various rates on the new capital will be paid up to March 31 last, which ends the financial year of the new amalgamated company. The basis of exchange adopted in most cases is 50 per cent. advance on

the old par value. In the circular issued by the Metropolitan Company I note the following passage: "Your directors feel that some such combination is absolutely necessary to enable them to face with confidence the keen competition which is to be anticipated from America and elsewhere. The advantages of such an amalgamation are obvious, as it will put an end to the hitherto keen competition between these companies, will effect a considerable saving in management expenses and the avoidance of duplicating special plant, and will enable the combined companies to undertake and carry out with dispatch orders on a much larger scale than has hitherto been possible in the case of any one of the companies."

Big Contracts in Egypt.

It is stated on good authority that the Egyptian Government will, in the course of the next few months, invite tenders for various work and material in connection with the proposed Berber and Suakim Railway, together with branches which have in principle been agreed upon, but the surveys for which have not yet been made. The great growth in the prosperity of Egypt justifies, it is said, the authorities in commencing these works sooner than had been anticipated.

Shipbuilding in Japan.

From an interesting report I gather that the Japanese Government are going out of their way to encourage the building of mercantile ships in Japanese yards. They offer a subsidy on all ships built in native yards of \$10 per gross ton on vessels of 1000 tons and upward, and a lesser subsidy on smaller vessels. To this substantial encouragement has to be added an additional subsidy of \$2.50 per indicated horse-power for propelling machinery. With inducements like these it is not unnatural that the energetic Jap should seek to build ships as well as to own them. Coal is plentiful and consequently cheap and so is labor. Skilled native artisans are employed for a wage of less than 50 cents per day. Again, the average Japanese workman is quite content to work on Sundays at the ordinary rate of wage, provided that he obtains two holidays each of one day's duration per month. It is interesting to read that all the shipbuilding yards in Japan, both Government and private, have their origin in ship repairing. Vessels were built abroad, but the advantages of having them repaired at home were so obvious that ship repairing in Japan is practically coincident with the Japanese ownership of ships. During the year 1901 the output of merchant shipping was under 7000 tons, but all this is very much in the nature of early experimentation, and the shipbuilders of Nagasaki are keenly intent upon much bigger things. Baron Iwasaki, head of the Mitsu Bishi Company, realizing that unskilled labor can be rendered more productive, has provided a school for the technical instruction of his workmen, and more particularly for the sons of his workmen. Fifty boys, ranging in age from 12 to 17 years, are admitted each year and pass through a five years' course of instruction in the various processes connected with shipbuilding, ship repairing and engineering. The education is free and no pledge is asked that the lads will, on the expiration of this apprenticeship, engage in shipbuilding work. After all, this is quite in accordance with the old Japanese system of trade guilds.

More Reorganization.

Some time ago I remarked that the Weardale Steel, Coal & Coke Company were about to reorganize their works in a very thorough way. The remodeling of two of the existing blast furnaces at Cargo Fleet has been begun. It has been decided to put down without delay a melting shop with two 160-ton tilting furnaces for working the Talbot continuous steel process, and to remove the cogging mill and the large plate mills now at Tudhoe to Cargo Fleet. The Talbot furnaces and the mills will be erected on freehold land recently acquired by the Weardale Company. It is intended to use the furnace gas, after being freed from dust, to drive the blowing engines, and to erect a battery of modern coke ovens, from which hot coke will be charged into the furnaces. The spare gas from the ovens will be used to generate steam throughout the works. The cost of the new plant, including an electrical power installation, will probably

exceed £250,000. This sum will be provided out of the reserves now in the hands of the company. The company are now obtaining the latest details in blast furnace construction and steel manufacture from America, and in coke making from the Continent. So far as the rolling plant is concerned, one of the plate mills, which is to be removed from Spennymoor, is the largest in the kingdom.

Railways in British Borneo.

A section of 60 miles of the first railway constructed in British North Borneo has formally been taken over by the Government from the contractors and is now open for traffic. This line, which is a portion of the trans-Borneo line, has been surveyed for a distance of 110 miles, and it is hoped that the whole section will be completed by the end of the year. The portion now open for traffic is between Jesselton Giza Bay, on the west coast, and Beaufort, an important agricultural town in the interior.

Profits and Dividends.

At a general meeting of the Harvey United Steel Company, held last week in London, the accounts for the last five months of 1901 showed an available profit of \$180,000, realizing a dividend of $7\frac{1}{2}$ per cent, and leaving a balance of \$30,000 to be carried forward. These profits represent only what has been earned by the former British and Continental Harvey companies, and not those which will accrue in due course from the American and French companies. The dividends on the shares of both the French and American companies are not payable during the period of five months ending December 31. The chairman, however, stated that the business affairs of both the British and American companies were in a very satisfactory condition. The chairman also stated that the serious litigation which had been in progress with the Terni Steel Company of Italy had been satisfactorily settled, the Italian company having paid a substantial sum in cash and acknowledged the validity of the Harvey patents.

Willans & Robinson, Limited, the well-known Rugby engineers, also report a satisfactory year's work. Larger profits than ever are shown and a 10 per cent. dividend is again paid. In view of the rapidly extending business secured by this company the debenture debt has been raised from \$500,000 to \$1,250,000.

The firm of A. & J. Stewart & Menzies of Glasgow report a net profit for the past year of \$530,000, a falling off compared with the years 1899 and 1900. Seventy-five thousand dollars go to depreciation and $8\frac{1}{2}$ per cent. on the ordinary shares is paid.

S. G. H.

The Algoma Steel Company.

SAULT STE. MARIE, ONTARIO, April 12, 1902.—The first steel to be rolled at the new works of the Algoma Steel Company was made this week, and the works have been running continuously since. It will be several weeks before the rolling of rails can begin, on account of delay on the part of contractors for roofs, &c., but the entire plant is expected to be in operation soon after May 1.

For the present the blooming mill is working on minor material for railway construction. The plant is working very satisfactorily and an excellent quality of steel is being turned out. Pig iron received from other works—Buffalo, Midland and elsewhere—forms the charge. The furnace plant of the Algoma Steel Company at this point is nearing completion. Lines of one of the two furnaces have been changed to fit it for use as a coke iron making furnace, and the other will remain, as planned originally, a charcoal stack. Seven stoves are erected. The pumping plant for furnaces and adjacent chemical works is complete with 20,000,000 gallons daily capacity and a steel water tower 150 feet in height. Ore receiving and storage docks 2200 feet long and nearly 400 feet wide, under the overhead movable bridges, are rapidly assuming shape. Cast house foundations are in and much other work is in progress about the plant. These furnaces are expected to this year supply pig iron to the converting plant.

The company have made sales of rails up to their

capacity for a reasonable period, and could, under present market conditions, easily make sales in the United States. But they expect to find ample market in Canada for a large output. Preparations have been made at the works for an increased capacity as soon as required.

The Sault Ste. Marie Pulp & Paper Company, an associated industry, are finding so large a demand for their new sulphide product that they will immediately increase their capacity by the addition of two large acid tanks. The mill is shipping large quantities of pulp to paper makers in both the United States and Canada.

There has lately been added to these associated Sault industries a car works, which is turning out daily one 40-ton standard freight car. A large saw mill plant is being erected on the company's Algoma Central & Hudson Bay line, and another will be built at the Sault. They will have a combined annual capacity for 60,000,000 feet, and will be supplied with timber from the company's grants. The Algoma Central & Hudson Bay Railway is completed for 45 miles north from the Sault, and grading is in progress considerably further. It is expected that during this year the line will be finished to the Josephine mine, Michipicoton range, where it will connect with the branch reaching to the Helen mine and Lake Superior.

At the Josephine mine a shaft will be sunk at once. Very important exploratory operations are under way on the Michipicoton range and elsewhere, and some excellent results are said to have been met.

D. E. W.

Central Pennsylvania News.

HARRISBURG, PA., April 15, 1902.—There have been various consolidation rumors going hereabouts, one of the most interesting being that the Central Steel Company would take over the furnaces, ore lands and quarries of the Paxton Iron & Steel Company, a concern composed of the McCormick Estate interests, but no one has anything to say about it yet. Another is that the American Iron & Steel Mfg. Company, operating large plants at Reading and Lebanon, are to go into a larger concern. Of this there is also little more than newspaper talk yet.

The Harrisburg Mfg. & Boiler Company have succeeded in filling some large pipe orders in Mexico and South America, and have recently received orders for a quantity of pipe for a water plant in Mexico and for their water tube boilers for the West and Southwest.

April has been a light month for the incorporation of iron and steel manufacturing companies at the State capital, the number having been small. There have been few increases of capital stock.

All of Waynesboro's works are in operation, and that part of Franklin County is enjoying unprecedented prosperity. Many of the works are compelled to run day and night, and the payrolls are the largest ever made out. The Landis Tool Company will build an addition of considerable size to the works, and the Geiser Company are making a large amount of work for shipment to other States. The Emmert Mfg. Company have had a steady run of orders for "Universal" vises, and are working men at night.

The Scranton Stove Works, who have been very busy, have granted their entire force of employees a 5 per cent. increase of wages.

The Pennsylvania Steel Company's entire plant is in operation, and the product is large. Last week the amount of metal sent direct from the four Steelton stacks to the steel mills was larger than for a long time. The company are having no trouble with fuel at present. Shipments have been large from the yards of the works, a big rail order having been made for Mexico.

The Century Stove & Mfg. Company have been formed at Johnstown with \$100,000 capital, and will build a large plant in the Johnstown wall paper mill. The directors of the new company are R. D. Wilson and Robert Monroe of Pittsburgh, Edrick C. Warren, John H. Waters and Samuel B. Waters of Johnstown.

S. S. Morton & Co. of York have enlarged their firm.

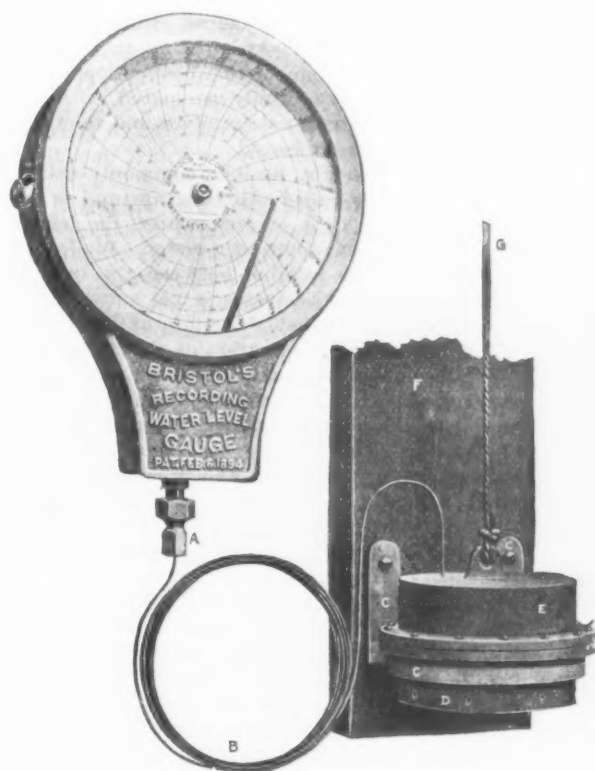
and will take up the manufacture of gasoline traction engines. The new company will have a capital of \$100,000, and will erect a building. The York Safe & Lock Company have taken a number of orders, among them being one for the new National Bank at Waynesboro. The Farquhar Company, Norway Iron & Steel and Susquehanna Iron & Steel Company's works are all busy.

Affairs at Lebanon are flourishing. All of the works are in operation, and it is likely that two furnaces, now being repaired, will be started before long. Last week was a particularly active one in the rolling mills. S.

The Bristol Recording Water Level Gauge.

The Bristol Company of Waterbury, Conn., are placing upon the market an adaptation of their well-known recording pressure gauge to an instrument for making a continuous record in ink upon a revolving chart, of the rise or fall of the level of water in a canal, reservoir, well, tank, or variation of sea level.

The construction and operation of the instrument will



THE BRISTOL RECORDING WATER LEVEL GAUGE.

be readily understood by reference to the illustration shown herewith. A represents the union joint by which a flexible capillary tube B is connected to the recorder. This connecting tube terminates in the upper portion of the bulb casting E, and when the instrument is in operation it is immersed to the depth a record is desired. Between the flanges of the upper and lower parts of the bulb E and D a flexible diaphragm (convex downward) of thin sheet rubber is firmly held, inclosing the proper amount of air for the operation of the instrument. Near the bottom of the lower casting D there are several holes for admitting water, the pressure of which acts upon the lower surface of the diaphragm, producing on the inclosed air a corresponding pressure due to its depth below the surface. The variations of the air pressure thus produced are communicated by means of the capillary tube to the recorder. The chart on the recorder is graduated into feet or inches head of water, or of the liquid which is being measured, and it may be adapted to almost any desired range.

The upper casting of the air bulb is provided with an eye for a cable suspension. The air bulb is also shown with a flange resting on a ring bracket, C. This bracket is designed to be secured to a plank, F, which may be lowered into the water to any desired depth.

The recorder may be located at any convenient point for observation, either above or below the surface of the liquid to be recorded. The accuracy of the instrument is not affected by the location of the recorder, or by the length of the capillary connecting tube.

An important advantage that instruments of this form have over those of ordinary type which are operated by floats is that its continuous performance and accuracy cannot be affected by ice in winter.

The Illinois Implement Industry.

The pre-eminence of Illinois in the manufacture of agricultural implements is not generally known. The exact standing of the State has recently been established in statistics issued by the United States Census Bureau. The figures have been analyzed by the *Farm Implement News* of Chicago, with the following interesting result:

The implement manufactories of Illinois constitute only 13.1 per cent. of the whole number, but they employ 39.4 per cent. of the total capital invested in this industry in the United States.

Their payrolls contains the names of 39.1 per cent. of the total wage earners engaged in the implement industry, and they pay 40.3 per cent. of the total wages.

Of the total number of salaried employees they have 44.2 per cent., and pay them 40.8 per cent. of the total salaries.

They use 42.6 per cent. of all the materials used in implement construction.

The value of their product is 41.5 per cent. of the total value of the product of all implement industries.

The Forter-Miller Engineering Company, Incorporated.—The Forter-Miller Engineering Company, Incorporated, Westinghouse Building, Pittsburgh, engineers and contractors for the erection of gas producers, blast furnaces, rolling mill and steel works equipment, have a very large amount of work on hand. This concern secured a contract some months ago for all the brick work for the three blast furnaces being built by the St. Clair Furnace Company at Clairton, Pa., and all the brick work for 12 50-ton open hearth furnaces, soaking pits, mill foundations and other buildings for the new open hearth steel plant being built by the St. Clair Steel Company at Clairton. Work on these contracts is pretty well under way. The same firm have a contract for all the brick work for two new blast furnaces being built by the Lake Superior Power Company at Sault Ste. Marie, Mich., and for all the brick work for the tin plate plant to be built by the McKeesport Tin Plate Company at Port Vue, near McKeesport. The Forter-Miller Engineering Company also have just completed 16 Forter water seal gas producers for the Inland Steel Company at Chicago. They are also building two large Forter water seal gas producers at the sheet mill plant of the Allegheny Steel & Iron Company at Tarentum, Pa.

Joseph T. Ryerson & Son, Chicago, announce in the April issue of the *Boiler Maker* that they are prepared to contribute \$1500 a year toward scholarships or other sources of knowledge dealing with steam engineering and the fabrication and erection of sheet metal in all forms. They propose to do this in grateful appreciation of the prosperity which has always been given their house, and in memory of the name and spirit of the late Joseph T. Ryerson, their founder. They have not formulated any details, but state that they feel assured that some plan will be forthcoming to enable them to make the Ryerson scholarship a means of inspiration and benefit to many in years to come. This scholarship is to be available "alike to the ambitious rivet boy, to the journeyman who would arise from the ranks, and even to that son who would succeed his well to do father."

Eastern Bridge & Structural Company, Worcester, Mass. are removing their office from 58 Front street to their factory on Crescent street. This move is made to facilitate the transaction of their growing business.

A Report on the Metric System.

WASHINGTON, D. C., April 15, 1902.—Chairman Southard of the House Committee on Coinage, Weights and Measures has completed the report of the committee on the bill providing for the adoption of the metric system by the Government of the United States, and through his courtesy the correspondent of *The Iron Age* is enabled to present the advance abstract given below.

As a preface to the discussion of the pending bill, which has been ordered to be favorably reported to the House, the report cites the constitutional provisions vesting in Congress the power to "fix the standard of weights and measures," and a brief historical sketch is given of the efforts made from time to time since the earliest period of the Government to reform the system in common use. Continuing, the report says:

The Weights and Measures in Common Use.

A complete statement of the weights and measures in common use would not only be difficult to make, but would involve more space than is available in a brief report. It is sufficient to state, however, that the various units have been inherited from a time when exact measurements were unheard of, computations were seldom made, and when each locality and different interest had its own system of measures. Modifications and adjustments have been made from time to time; nevertheless, the system is full of inconsistent ratios, the units are not related to each other, many units of the same name have different values, it is unsuitable for computation and is not decimal in character. This last defect has sometimes been urged in its favor, but it is difficult to comprehend how any one familiar with the subject should advocate any other than a decimal system of weights and measures in connection with a decimal system of numbers. It may be true that a system of weights and measures in which a binary subdivision is followed might be better in a few instances, but, on the whole, experience has shown that the advantages to be gained by a decimal system far outweigh those of any other. However, it should be noted that a binary system of subdivision is but seldom followed in our common system of weights and measures, and further that a decimal system is capable of this method of subdivision, as illustrated by the use of halves and quarters in the metric system of measures and in all decimal systems of money.

It is a popular fallacy that our weights and measures are in accord with those of Great Britain, but this not true, as neither our pound, the yard, the gallon or bushel are identical.

Very few people are familiar with the weights and measures in common use in the United States. One has but to recall the tables of our three different systems of weight, the apothecary, the troy and the avoirdupois, to illustrate this fact. And while the yard may be stated as our standard of length, we find in practice various arbitrary multiples of the yard and foot; for example, the fathom, the surveyors' and engineers' chains, the nautical and statute miles, hands, poles, perches and various others. In addition to the ordinary cubic measure, we find three systems of measuring capacity: dry measure, liquid measure and apothecary's fluid measure. To these might be added a large number of technical standards in use in the various trades and industries, which would be greatly simplified and unified upon the adoption of the international system of weights and measures. An examination of the common tables of weights and measures discloses the fact that there are 64 different ratios used, of which 19 are not divisible by two, and that there are 18 terms used which have two or more meanings. Certainly any effort on the part of Congress to replace this conglomerate system with a simple, logical one similar to our monetary system is worthy of the consideration of Congress.

The Metric or International System.

The metric system of weights and measures was devised as an international system. The fact that it was first adopted by France has given rise to the custom of referring to it as the French system. It is interesting

to note, however, that one of the first to propose a decimal system of weights and measures was James Watt, the inventor of the steam engine, and the adoption of a decimal system of coinage by the United States was one of the strongest influences leading to its adoption. As originally proposed the unit of length in the metric system was called the meter and defined as the one ten-millionth part of the distance from the equator to the pole of the earth measured on a meridian. The first of these units to be constructed was by the French Government and was based upon the best known measurements of the earth's surface at that time. Subsequently more accurate measurements of the earth's surface showed that the meter as first constructed was not of the length intended nor was its material or form such as required by modern refined measurements.

To remedy this defect an international congress was held in Paris, 1875, 17 different nations participating. It was thought best to retain the length of the old meter. Accordingly a number of copies were constructed of the best material and method of construction known to science. One of these was selected as the International Meter and is very carefully preserved at the International Bureau of Weights and Measures, established and maintained by the countries participating in the congress and those which joined the convention later. These meters were very carefully compared with the one selected as the international standard and then distributed to the countries interested.

The unit of mass (weight, as it is commonly called) in the metric system is called the kilogram and is defined as the mass of a cube of pure water, the length of the edge of which is one-tenth of a meter. While this definition establishes the relation between the unit of length and the unit of mass, water is not suited for a material working standard, hence the international committee at the time of the preparation of the meter also prepared 40 pieces of metal equal in mass to that of the cubic decimeter of water, and alike in form and of the same material as the standard meter, the most permanent metal known. One of these was retained at the International Bureau of Weights and Measures as the International Kilogram. The same precautions were observed in the comparisons with each other and with the one selected as the international standard before distributing them to the respective governments. Of the two meters and two kilograms sent to the United States one of each is preserved as the national standard of length and mass, the others are taken as working standards and serve as the basis of all comparisons of length and mass in this country. The fact that the meter is not a natural standard as originally intended has sometimes been used as an argument against the metric system. This, however, is of little importance, since the meter and the kilogram as constructed are as permanent as it is possible to make material standards, and if at any time a suitable natural standard should be discovered the meter would simply be defined in terms of that standard as was originally proposed of the earth's quadrant.

The advantages of the metric system may be briefly stated as its decimal character throughout, the simple relation between the units making it possible to derive all others directly from the unit of length; its elasticity, being equally convenient for the measurement of the smallest or largest objects. These advantages have been proven by a century of use, but that which especially commends it to us at the present time is its international character, since it is the opinion of all who are in a position to know that the world must soon come to an international system of weights and measures, and there is not the slightest possibility of our own system or any modification of it becoming universal.

The Metric System as Used in Scientific Work.

Scientific investigators early recognized in the metric system of weights and measures a simple, flexible system equally suitable for the most refined or coarsest measurements or for purposes of computation. As a result the scientific world to-day enjoys the advantages of a universal system of weights and measures, a fact which has greatly facilitated the development and

spread of scientific knowledge. The practical applications of scientific work have in many cases been seriously handicapped or retarded, owing to the necessity of converting formulæ derived in the metric system to equivalent formulæ in the common system. If the formulæ and other data used in manufacturing and engineering were universally expressed in the metric system it would greatly promote the growth and dissemination of such knowledge throughout the entire world.

Benefits to Be Derived by Educational Interests.

The benefits to be derived from the adoption of the metric system by the educational interests of the country are, perhaps, the most important that have been brought to the attention of this committee. Estimates made by the Department of Education and others show that the work of at least two-thirds of a year in the life of every child would be saved by the adoption of the metric arithmetic. The British Parliamentary Committee having in charge a similar investigation estimated the saving in time at one year. This is a matter the importance of which can hardly be overestimated, taking into consideration the large amount of work to be covered in the curriculum of the schools and the enormous sums annually devoted to educational work. The metric system is taught in nearly every school in the country. Teachers and pupils alike unanimously testify as to the ease with which the system is taught and learned and the facility with which it is applied to the problems which in ordinary arithmetic are complex and difficult to solve.

In higher education the metric system of weights and measures is used almost exclusively, and attention is called to the action of the Associated Academic Principals' Association of the State of New York, a body of some 700 high school principals, superintendents and prominent educators, which has passed the following resolution in regard to the adoption of the metric system: "Resolved, That we hereby instruct our Legislative Committee to forward to Congress of the United States, if there shall be suitable occasion and opportunity, our earnest petition for the enactment of such legislation as shall render the use of the metric system obligatory throughout the United States." Many similar actions by educational bodies of all kinds throughout the country have been called to our attention.

It is a matter of evidence on the part of educators of the United States, Great Britain and Continental Europe that the metric system and its application to the solution of problems may be learned in one-tenth the time required for gaining an equal facility in the use of the English system of weights and measures. The question might well be raised whether any measure of more vital importance and benefit to the educational interests of the country has ever come before Congress.

Value in Daily Transactions.

The necessity for an improvement in the weights and measures of the country is nowhere more apparent than in the ordinary business transactions of daily life. Grain and produce are bought and sold by capacity measure—the bushel, peck and quart. The necessity for handling these commodities in large quantities by weight has resulted in the adoption of different weights for a bushel for the same commodity in different parts of the Union, and in a few of the Western States the hundred-weight is used instead of the bushel. The diversity in this respect is so great that a correct table of the number of pounds to the bushel of different commodities for the several States is difficult to procure.

Both the long and short ton, without any distinction in name, are used in the buying, selling and transportation of coal, ore, metals and other heavy products. For liquids in large quantity the barrel used has many different values, and we find in common use, often side by side, avoirdupois weights, troy weights, apothecary weights and the weights of the metric system. To add to this confusion the subdivisions of the ordinary measures are often not adhered to, the engineers using feet and tenths of a foot, instead of feet and inches; the manufacturer, inches and decimals of an inch, instead of adhering to the binary subdivision; and even the gauger uses gallons and tenths of a gallon.

In the customs service duties are levied in yards and tenths of a yard, and in the handling of bullion we find troy ounces and thousandths of an ounce, instead of ounces and grains. The engineer has discarded the inch, while some manufacturers of machinery have discarded the foot; hence we find the tenth of a foot and the inch in common use. These are but a few of the instances where the introduction of the metric system would not only afford the advantages of a decimal system, but a system sufficiently elastic for all purposes. The experience of other nations has shown that the confusion and inconvenience caused by a change in the measures used in daily life were largely overestimated, and in no case have the people expressed a desire to return to the former system of weights and measures.

Extension of Commerce.

The enormous development of the commerce of the United States within recent years has brought to the attention of our merchants and business men the great advantages to be derived from the adoption of the international system of weights and measures. The use of the old system not only involves great loss of time in making computations, but places our merchants at a great disadvantage in dealing with countries which have already adopted the international system. More than 60 per cent. of our commerce is now carried on with countries using the metric system, and it is evident that the commerce of the world must soon conform to the metric basis. Theodore C. Search, president of the National Association of Manufacturers, states as follows:

"Wherever manufacturers undertake to extend their trade in foreign countries they encounter the metric system, and it is the only system of absolute uniformity which prevails throughout the world. The pound, the quart, the gallon, the ton, have varying values wherever encountered in foreign countries, and to insure accuracy the use of these units requires further explanation and some qualifying description in order to indicate just what quantity is meant. The enormous growth of our export trade during the past four years has brought our manufacturers in touch with the outer world as never before, and has given very practical illustration of the cumbersome character of our methods of measurement and the advantages to be derived from the adoption of a system which is absolute and uniform throughout the world."

As we have only just entered upon a commercial conquest of the world, the utility of the metric system will become more and more apparent and the necessity for its adoption more urgent with each year of our growing export trade. The extension of our governmental functions to the Philippines, Cuba and Porto Rico brings into the circle of our commercial operations millions of people to whom the metric system is the recognized standard, and to whom our own cumbersome systems of weights and measures are a strange and unknown language of trade.

We recognize that any effort to supplant our present system of weights and measures with the metric system will be attended with more or less difficulty, and will involve a great deal of trouble for many of our manufacturers, because of the necessity of changing drawings, patterns and standards, but we believe it entirely possible to accomplish such a change by gradual steps, and there should be no necessity for causing loss or injury to any of our industrial interests. It seems to your committee that every argument is in favor of the unification of standards of weights and measurements throughout the world, and for us to insist upon an adherence to our own antiquated standard is not in accord with the progressive nature of our people and the progressive tendency of this age.

W. P. Wilson, director of the Philadelphia Commercial Museum, states his belief that "millions of dollars are lost every year in transposing our weights, measures and money from that of one country to another in our international business relations." The testimony of Godfrey L. Cabot, a prominent merchant of Boston, includes the following statement: "Wherever this great improvement has gone it has simplified the ordinary commercial transactions of daily life, minimized disputes, and given an

absolute standard from which there could be no appeal and in which there was the least possible danger of error or misunderstanding."

Metric System in Manufacturing.

Any change in the standards employed in manufacturing, no matter how perfect the system proposed or how beneficial the change may be, must be very carefully and judiciously made. In the case of textile fabrics, materials of construction, package goods and almost all kinds of manufactured products, a change would no doubt involve some inconvenience, but the expense of modifying existing plants or machinery would be very slight, as compared with the cost of the machinery, and in many cases no change or expense is necessary; and the benefits to be derived from a convenient and universal standard would far more than compensate for the expense and confusion temporarily involved during the transition stage. The relation between the manufacture and sale of these products is so close that any change in the system of weights and measures which will lessen the burden and expense of the counting room and office is worth the cost considered from the standpoint of economy alone. The action of many associations of manufacturers and merchants, both in the United States and Great Britain, has been called to our attention, and without exception they have urged the adoption of the metric system of weights and measures, on account of its international character and superiority over the present system for manufacturing and commercial purposes.

In no other country has the construction of machinery reached a degree of perfection superior to that of our own, a result principally due to the system of interchangeable parts. The latter may be said to be a product of American ingenuity and to be the greatest single advance in modern machinery, and it has for its essential features a uniform standard of length and accurate length measuring instruments. This work has been done upon the basis of an inch which in many cases has been decimalized.

There are a few who claim that the inch is better suited for this purpose than the units of the metric system. However, it should be kept in mind that the interchangeable system does not depend upon the unit used, but upon uniform, reliable standards and accurate measurements, and it is difficult to see why the inch and fractions of an inch should be superior to the centimeter and decimals of a centimeter or millimeter and decimals of a millimeter, or why German, French, English and American manufacturers who are successfully manufacturing upon a metric basis, in but few instances, even in the case of the American and English manufacturers, have shown any desire to return to the old system, notwithstanding the fact that the change has been made in the latter case under very adverse circumstances.

It is admitted that the temporary inconvenience caused in the shop and drafting room by the proposed change would be very serious if suddenly brought about, but any measure which contemplates only the gradual introduction of the one system for the other, or even the continuation of the old in case it is desired, cannot be said to be compulsory or capable of producing more than a minimum of inconvenience or expense, and certainly an interchangeable system upon an international basis will be far superior to that of a single country alone.

W. L. C.

The catalogue issued by the Thomas S. Clarkson Memorial School of Technology, Potsdam, N. Y., includes in its announcements for 1902 and 1903 an outline of the course of mechanical engineering, which includes, among its subjects, heating and ventilation, steam and refrigeration and the construction of the various types of steam boilers. Courses are also given in chemistry, civil engineering, drawing and design, engineering, economics, electrical engineering, home science, hygiene, mathematics, mechanics, physics, physiology and shop work. The shop work includes wood turning, pattern making, forging, foundry work, bench iron work and machine tool work.

Canadian News.

TORONTO, April 12, 1902.—At a meeting held on Thursday the council of the Toronto Board of Trade decided to call a conference of all the boards of trade in Canada to consider general commercial questions, and especially to draw up an expression of the commercial sense of the country in respect to questions likely to be touched in the imperial and intercolonial conferences to be held in London in June, in which Sir Wilfrid Laurier and other Canadian Ministers will take part. A committee of the Toronto Board is at present engaged in drafting a series of resolutions to be presented at the conference of Canadian boards here.

John Bertram of the Bertram Engine Works Company and Arendt Angstrom, manager of the works, addressed the council at the same meeting in favor of a Government subsidy to steel shipbuilding. A committee was appointed, made up of influential members of the board, to deal with the matter, and, if advisable, to draw up a resolution approving the idea of a subsidy. It is almost a certainty that the committee, the council and the board as a whole will declare in favor of a liberal bonus, in the conviction that Ontario will reap material benefit by enlarged operations in shipyards on the lakes. Both the Bertrams and the Polsons, in this city, and the shipyards in Collingwood are very busy as it is.

Wants Canadian Labor in Steel Works.

Dr. Kendall, M.P., of Cape Breton, made a speech in the Dominion House the other day in which he had some fault to find with the administration of the alien labor act, though in no other respect did he consider the Government open to adverse criticism. He referred to the importation of workmen from the United States for employment at the furnaces of the Dominion Iron & Steel Company. Though a Ministerialist, Dr. Kendall considers this a grievance and a violation of the spirit of the alien labor act. Men were brought in, he says, who were not required—that is, men could have been found at home capable of doing the work that was taken up by the imported labor. Canadians are employed at the works, he further complains, at wages not more than 60 per cent. of those paid to Americans rendering the same kind and amount of service. As, in his opinion, the steel industry is the creation of the Government, he considers the Government bound to see that Canadians should not be deprived of any of the wages they are ready and qualified to earn in it. Certain directors of the company, he says, have promised him that the grievance will be remedied, but he desires to make sure that it will, and therefore suggests that the Government should interest itself in the matter.

Dr. Kendall may be not quite fair to the company. He may be biased by a natural desire to keep himself popular with the voters of Cape Breton, a very large proportion of whom are dependent for labor on the works at Sydney. There is no doubt that when the works were started the required quantity of skilled labor could not be obtained at home. Some had to be brought in from other iron and steel making centers, and accordingly men were got across the line. The company explained the situation at the time.

Iron on the Canadian Northern.

According to advices received at the Ontario Bureau of Mines there is much testing of iron properties along the line of the Canadian Northern through the Rainy River district. On the Atikokan and Steep Rock ranges the activity seems to be most marked. W. E. H. Carter of the Bureau has so reported. R. H. Flaherty, representing American capitalists, is conducting several tests. Roads are being built under his direction from the railway station to mining locations for the purpose of moving in machinery and supplies. The Government diamond drill is at work on one of the properties close to the railway, and another diamond drill and two stand pipe drills are to be employed. In the Nepigon Lake region a third diamond drill is being put in. Two churn drills are on the way in, to be used in exploring three groups of claims that have been struck by an old prospector. Mackenzie & Mann, the builders of the rail-

way, are interested in iron claims from Lafame Lake to Steep Rock Lake, and they intend to begin tests very shortly. Several magnetite locations at Lafame Lake are owned by R. M. Hunter of Duluth, who has options on a number of others. He is expected to do a considerable amount of development work, besides getting out 1000 tons of ore from the Atikokan tunnel, east of Lafame Lake. The fine hematite ore found in the drift at Steep Rock is exciting considerable interest. In the flatlands, which are more or less swampy, it is thought by the parties interested that by drilling vertical holes through the overlying rock beds of hematite ore will be found. On Seine Bay, Rainy Lake, J. P. Horn, J. Mosher and others have a number of iron locations on which it is proposed to start drilling this summer. Now that the Canadian Northern is fully constructed and in operation, it is expected that there will be a fairly large quantity of ore mined in the Rainy Lake district.

Visiting the Sault Steel Plant.

The members of the Ontario Cabinet left Toronto on Wednesday to visit the works operated at Sault Ste. Marie, Ontario, by the Clergue companies. They went upon the invitation of Mr. Clergue, who desired them to see the steel works in operation. The Government of the Province has a close interest in the industrial developments at the Sault, for the reason that they spring, in part, from concessions made by it to Mr. Clergue and his fellow projectors. The pulp mills are the outgrowth of an agreement made with the Government under which rights to cut pulp wood from the crown lands were conceded by the Government to the company, the company on their part undertaking to build mills of a certain capacity and operate them upon a prescribed scale. The steel works, the chemical works and other enterprises there are regarded by the Government as a development of its railroad policy, very large concessions of land, with timber and mineral rights, having been granted to the Clergue capitalists to assist in the building of their lines of railway into and across the mineralized and wooded belt. In his words of welcome to the visitors Mr. Clergue mentioned that from a contemplated expenditure of \$4000 the outlay of his syndicate had been increased to \$20,000,000.

The Nickel Properties Not in the New Company.

To say nothing of the numerous nickel claims owned by various parties, there are three companies here actually engaged in nickel production or contemplating production on a large scale that are not in the newly formed International Nickel Company. They are the Mond Nickel Company, the Lake Superior Company (a Clergue concern) and the Nickel-Steel Company of Canada. The last named are not often spoken of nowadays, the Ontario Nickel & Copper Company having practically taken their place, both being pretty much of the same composition, but the one having a Dominion, the other an Ontario charter. The latter own considerable deposits on which something has been done, and they have works in Hamilton, though no matte or nickel steel has been produced by them. The Mond Company have furnaces and are producing matte. The Lake Superior Power Company are working a mine in Creighton township. From this mine is expected to come the ore for Mr. Clergue's ferro-nickel.

Minor Notes.

Between 65 and 70 employees of the Hamilton Steel & Iron Company have gone out on strike. They had asked an increase of 10 per cent. in the rate of wages they were receiving, but it was not conceded. It seems that the men left suddenly, and the company say that care was not taken to leave the furnace in proper condition.

P. A. Petersen, chief consulting engineer of the Canadian Pacific Railway Company, who is now in Europe inspecting the manufacture of rails for the company, has left Germany for England, where he will consult manufacturers as to a special make of steel for the company, and especially discuss the proper chemical composition of steel rails.

At a meeting held in Vancouver, B. C., an agreement

was arrived at for consolidating the cast iron foundries of the Province, ten in number, in a company with a capital of \$1,000,000. Competition in foundry products has been very keen on the coast.

It is expected that two blast furnaces will be in operation at Sault Ste. Marie by next August.

C. A. C. J.

Lake Iron Ore Notes.

DULUTH, MINN., April 12, 1902.—Shipments of ore are going along rapidly now from the mines of nearly all shippers. Owing to unusually low water on the lower lakes there have been excessive marine disasters, no less than four of the ships of the United States Steel Corporation having been on the docks at one time the past few days. This low water is not apparent on Lake Superior, which is as high as usual and is pouring its customary flood through St. Mary's River. There seems some ground, therefore, for the claim that the Chicago drainage canal is having an effect.

For the seventh annual period the Cleveland-Cliffs Iron Company have offered prizes to residents of locations in Ishpeming for care of ground. The result of these prizes in former years has been to make Ishpeming the prettiest and most attractive place of all Lake Superior mining locations. The cost of these prizes is out of all proportion to their value, and their reflex action in securing good work at the company's mines can scarcely be measured.

The United States Steel Corporation are supposed to be behind explorations that were under way west of Lake Superior in Ontario last year and that have just been resumed with diamond drills. So far as known nothing of value was found last year. This work has been under the supervision of R. H. Flaherty of Port Arthur.

At the Mesaba range all steam shovel mines are now at work. Floods in the West have delayed receipt of timber and supplies urgently needed for dock building, and the roads are unable to handle the ore which the mining companies are prepared to ship. A sale has been made to Eastern steel making interests of about 3,500,000 tons of ore in the ground in section 27-58-20. This ore pays a 25-cent royalty and the sale was at \$125,000 bonus. There is probably a far larger ore body than has been proved up. The Eastern Minnesota Railway is mixed up in this sale to the extent that it will handle the traffic to Lake Superior.

A large amount of exploring is under way in township 58-19, a town that was gone over in the early days more or less carefully. In this town are the Sharon, Grant and Kinney mines, belonging to the Sharon Steel Company, Jones & Laughlins and the Republic Iron & Steel Company. The Eastern Minnesota Railway has drills at work in section 15 and has found ore there. R. Whiteside is working in the same section, as is M. L. Fay. The La Belle Iron Works have a 40 there also. Joining these explorations on the west D. E. Woodbridge is exploring section 16, and joining him to the south is the Monroe Iron Company. On section 11 the Republic Iron & Steel Company have a small find, and D. E. Woodbridge has a drill there. In section 22 M. L. Fay has a drill; in section 26 work is to be done, and on the west side the town drills will go in.

The Donora Mining Company (Union Steel), who have found 5,000,000 tons of ore in township 59-15, are to explore in the northwest corner of 58-15 east of Biwabik.

On the Marquette range a hole has been sunk near Republic 2400 feet deep, making it one of the deepest borings on the iron ranges. The old American mine is to be unwatered and explored at once, as will be some other properties near it. At the Cleveland-Cliffs Company's new Maas mine the shaft is being steadily pushed down, though not without trouble from sand, water and boulders.

D. E. W.

The Board of United States General Appraisers in the case of O. G. Hempstead & Son of Philadelphia have decided that ferromolybdenum is dutiable at the rate of 20 per cent. as a metal unwrought, and not at the rate of 45 per cent. as a manufacture of metal.

The Philadelphia Foundrymen's Association.

The one hundred and seventeenth regular meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club, Philadelphia, Pa., Wednesday evening, April 2. This meeting was called to order at the usual hour, President Thomas I. Rankin occupying the chair. Among those present may be mentioned the following:

I. W. Rankin, Abram Cox Stove Company, Philadelphia.
 Jas. S. Stirling, Harlan & Hollingsworth Company, Wilmington.
 Douglas G. Moore, Sam'l L. Moore & Sons Company, Elizabeth, N. J.
 John Birkinbine, Philadelphia.
 C. Kirchhoff, *The Iron Age*, New York.
 P. D. Wanner, Reading Foundry Company, Reading, Pa.
 G. W. Vantine, Singer Mfg. Company, Elizabeth, N. J.
 C. D. Matthews, Camden Iron Works, Camden, N. J.
 J. Henry Pepper, *Iron Trade Review*, Philadelphia.
 A. G. Warren, J. W. Paxson Company, Philadelphia.
 H. B. Lincoln, Jas. Smith Woolen Machinery Company, Philadelphia.
 E. E. Brown, E. E. Brown & Co., Philadelphia.
 W. D. Koch, Philadelphia Sash Weight Works, Philadelphia.
 Benj. Fox, Philadelphia Sash Weight Works, Philadelphia.
 C. D. Nourse, Alexandria Iron Works, Alexandria, Va.
 Dr. Edw. Kirk, Philadelphia.
 Thos. B. Harkins, Harkins Foundry, Bristol, Pa.
 J. Thompson, J. Thompson & Co., Philadelphia.
 H. O. Evans, Thos. Devlin & Co., Philadelphia.
 Thos. Devlin, Thos. Devlin & Co., Philadelphia.
 Wm. Hanson, Pennsylvania Iron Works Company, Philadelphia.
 Geo. C. Davis, chemist, Philadelphia.
 H. L. Haldeman, Pulaski Iron Company, Philadelphia.
 Mr. Hardy, Pennsylvania Iron Works Company, Philadelphia.
 A. A. Miller, *The Iron Age*, Philadelphia.
 Thos. Hobson, *The Iron Age*, Philadelphia.
 Jas. L. Keightley, Geo. V. Cresson Company, Philadelphia.
 Oregon J. Ward, Howe Scale Company, Philadelphia.
 W. J. Faux, Philadelphia.
 Geo. W. Ellicott, Southwark Foundry & Machine Company, Philadelphia.
 Andrew Barr, Philadelphia.
 Howard Evans, J. W. Paxson Company, Philadelphia.

After the minutes of the previous meeting had been dispensed with in the usual manner, the Executive Committee, through P. D. Wanner, announced the changes necessary in the constitution and by-laws of the association to conform with the necessary legal requirements for incorporation, which, on motion, were adopted. There being no other business of importance before the meeting, Charles Kirchhoff, editor of *The Iron Age*, was introduced, and read a paper entitled

"The Trusts and Their Effect on the Business World,"

which follows:

I am rather inclined to object to the term "trust," since it carries with it in the popular mind the odium of actual or attempted monopoly. It is true that James B. Dill, an eminent authority, describes a trust as a "dominant combination of money, property, business or commercial power or energy," and that he emphasizes the "dominant." But in the community at large the term trust is coupled with the idea of an effort at monopoly. Personally I prefer the term "consolidation," because that describes better the organizations which have recently developed in the iron and allied industries. As a matter of fact, not one of them in the trades referred to can claim or ever hope to secure a monopoly, and we must deal, therefore, with the question to what extent the existence of dominant consolidations affects the industries and trades of which they are a part.

The movement toward consolidation and concentration is a living force with which every one must learn to count. It is the greatest modern revolution, whose scope and tendencies affect the investor and the workman, the trader and the engineer. Possibly it is still much too early to measure its strength or foresee its direction in the future, but we have been making history rapidly and we may be able to discern even now general tendencies.

In the iron and allied industries the fear of actual monopoly is disappearing. It can be based only upon the complete control of the mineral resources of the United States and of countries whose mineral products can be made tributary to the manufacturing industries of this country. In the case of coal it is true that the

boundaries of the deposits may be accurately ascertained, but their extent in the United States is so vast that the danger that they can be controlled need not trouble any one in the present generation.

With iron ore there is the constant risk that new deposits may be discovered, and this applies not alone to this country, but to all countries capable of placing ore cheaply into ocean steamers, because ultimately the duty on iron ore will disappear.

But it may be urged that it is not necessary to secure actual monopoly. All that is required is control of those deposits which are richest, most cheaply mined or exceptionally well located, and this applies, too, to coal property. The advantages which this possession represents may be measured by dollars per ton of product. But usually thus far these advantages have been capitalized in the purchase; in fact, have generally been overcapitalized. It is certain, too, that the search for and the development of mineral resources has been greatly stimulated.

Of course there can be no monopoly of the instruments of production proper, of the manufacturing plant, of machinery and of methods, except through patents, which are rather uncertain property. On the contrary, the creation of the consolidations has rather stimulated than it has checked the building of manufacturing plant, in two ways. It has forced existing outside concerns who were making only partly finished goods to pursue the manufacture to the final market product. It has forced makers of finished goods to go back to the raw materials in order to secure independence. It has been tempting moneyed men who sold out to re-enter the business with new equipment, either as a *bona fide* enterprise or to repeat the operation of selling out. Finally it has had the effect of attracting new capital into the business, and in some cases has led large consumers to go into manufacturing to protect themselves against the danger of real or fancied extortion.

Then the majority of consolidations soon find themselves in the position of themselves increasing productive capacity. Every one of them has fallen heir to rattletraps, which must either be abandoned or remodeled. Every one has a large proportion of plants which require heavy expenditures for new equipment and facilities to bring them up to the standard of the best units.

So far as the individual producer is concerned, the effect of the establishment of consolidations is to lead to an increase in the manufacturing capacity. While the number of competitors may have been very materially reduced, competition proper may be rendered greater and more dangerous.

Nearly every one of the consolidations in the iron trade has been seriously overcapitalized. In itself the issue of reams of common stock, to represent so-called good will or presumptive earning capacity, does not mean much. A part of the issue of securities may be justified on the ground that it represents the capitalizing of the economies due to consolidation. These economies are great. They are greater than is generally realized. But even in very favorable cases they cannot give substance to the water which has been poured in, and the management must face the problem of earning a return on greatly inflated expectations, particularly during the period when the financiers are at work creating a market for the paper capital. This condition of affairs is unsound not alone for the particular enterprise, which is a matter of concern only to those directly interested, but also to the industry at large and all those engaged in it. We see nearly every undertaking of this kind staggering under a load of fixed and semifixed charges, which invite competition and threaten trouble not only at the financial end, but also to labor and capital in cognate undertakings. We shall see heroic attempts to meet promises and expectations doomed to failure, and by sympathy affecting others besides those directly interested.

There has been introduced into the American iron trade, through the creation of the consolidations as public companies, an entirely new element, and that is the dealing in stocks on the exchanges. What that means,

in the worst form, has been abundantly proved over and over again in connection with the transportation interests of this country. Only lately we have had a striking example nearer home of the close relations between stock gambling and a branch of the metal industry—in copper. For years it has been as important for a consumer to study the quotations for copper stocks as it has been to keep track of the market for the metal. Speculators, often in charge of great mining enterprises, have boomed or depressed the prices of their own product with the sole object of unloading securities or frightening their own fellow stockholders out of their shares. We have not had this experience in its fully developed form in the iron trade, but incidents have occurred which are freely charged to that cause. We cannot in any case ignore the fact that some danger does lurk in that direction.

But after all, what we must consider more particularly is the effect of the modern dominant consolidation upon the manufacturing industries in which it is a power. Let us take first the relations among producers themselves. The reduction in the number of them makes it much more easily possible to get together for the protection of mutual trade interests. This means that agreements are more readily reached and more readily maintained. It is curious that the consolidations to which producers were driven through despair over the failure of trade agreements rather encourage their revival. In other words, the existence of the consolidations makes for more prolonged periods of industrial peace. On the other hand, it is true also that when a conflict does come it is far more intense and temporarily more destructive. The consolidation, covering as it does a wide range of products, can fight with extreme vigor in one branch and draw in sinews of war from others not disturbed. It may single out some territory as the battleground and destroy those who are dependent upon particular local markets. To the outside producer, particularly the smaller one, the new movement has brought serious dangers.

So far as the consumers are concerned there has been quite a good deal of complaint in the early stages of the life of the consolidations. Some of them who enjoyed special favors from some individual plant have found that advantage swept aside, and their outcries may be passed over as selfish. But a good many consumers have suffered from the rupture of close business relations of long standing. During the period during which the new organizations were forming there was a good deal of confusion and the service was undoubtedly bad. Little complaint of that kind is now heard of, although the conditions are trying.

It is a general proposition that the consumer will usually give the outside producers the preference. He believes that his interest is to foster and encourage competition, and he usually feels that with a small concern his status as a customer is better than it is with an enormous consolidation. The managers of the latter, however, claim that in the long run, year in year out, they can and do give better service, that interruptions of it are less liable to occur and that quality is more reliable.

So far as the distributing trade is concerned the consolidations show a disposition to deal liberally. By attractive terms and careful protection they are making the jobbers their allies. In many cases they have withdrawn from the direct business with smaller consumers, which the constituent concerns had developed and encouraged. Undoubted abuses have thus been done away with. It is probable that this policy will be continued as being safe and wise.

As against that the sphere of the broker and commission merchant has been very much narrowed by the creation of the consolidations, who claim that in that direction they have effected economies. What loss the middlemen have suffered in this manner is compensated for to some extent by the newly established plants, of whom many need the experience and the capital of the broker and the commission merchants.

No data have yet been furnished as to the economies secured by the saving in cross freights, but there can be no doubt that the loss of earnings to the railroads through this source must be very large. There can be

little doubt, too, that the importance as shippers of enormous amounts of raw materials and of finished goods must place some of the consolidations in a very different position with the railroads than even the greatest of the constituent companies occupied. It is a fact that outside producers are very apprehensive on this score, since the ramifications of the influence of the modern consolidations in financial and transportation circles are very extensive and very powerful.

During the present enormous consumption of iron and steel in this country, straining as it does our entire productive capacity, the question of the influence of dominant organizations has been much discussed. It is certain that an earnest and largely successful attempt has been made to hold values steady and to prevent a runaway market, which in the end would inflict injury overbalancing by far the temporary gains from a brief period of boom prices. The enormous power of the leading consolidations has been thoroughly proven during the past few months, but the inference frequently drawn from these events that trusts have the ability to prevent declines below certain limits hardly seems to be warranted.

The lowest cost of production of goods is not reached at a time when all the plants are run to full capacity, because many of them are poorly equipped or are at a disadvantage in other respects. It is attained when the best part of the capacity is in full operation and the cripples are idle. To that extent, therefore, the consolidations may adjust themselves effectively and profitably to a restriction in the consumption.

But it has become an axiom almost with our modern captains of industry that the plants must be kept full. When the domestic market cannot supply the tonnage the foreign fields must be invaded. It costs more money to do foreign business, and for many years to come the greater part of the sales will net less. In other words, in most cases export business must be done at a sacrifice. At once the question arises, Who is to bear the burden? It is not likely that any consolidation, however powerful, will be content to allow an increasing share of the more valuable domestic market to fall to the lot of outside competitors, particularly in those branches in which standard products are the same the world over and price alone determines the placing of the order. It is the surplus product which determines the course of the market, be it only an insignificant percentage of the total tonnage. Consolidations may have the advantage of lowest cost of production, but it is a question open to doubt whether, when the fixed charges are added, they are in a much better position than many outside competitors.

Let me say right here that there is a good deal of loose talk about fixed charges, and that they are generally overstated, taking the tonnage as a basis. It is a very familiar method, for instance, in the case of the United States Steel Corporation to figure out the annual interest and preferred stock charges and divide that by a guess at the annual product of steel, this making a "fixed charge" of \$5 or \$6 or \$7 per gross ton. Such figures look very formidable when applied to rails or bars or other coarser goods. But the corporation make a very large tonnage of more highly finished goods up to the finest music wire, so that it is a fallacious argument to base comparisons of fixed charges on crude steel tonnage.

Returning from this digression, the question remains, How are the consolidations to deal with the growing competition?

It may be urged that the consolidations will be driven, through the fact that it is the line of least resistance, to acquire outside plants. This is certainly a simple way, but there is a limit to it. It is not always an attractive proposition to retire from business or become a subordinate of a huge organization, and the price set upon undertakings so controlled is likely to be high. A well recognized disposition to acquire competing concerns would encourage a disposition toward speculative building which it would take a good deal of expensive punishment to dispel.

As I understand the situation, it is the aim of the managers of different consolidations who have ex-

pressed their views to steadily reduce costs by perfecting their organization and their equipment. As to the former, it does not seem that the difficulties are any more serious than those which are encountered by some of our enormous railroad systems, with their varied commercial, technical and operating interests. As to equipment, the majority of American managers may be trusted not to sin in the direction of dangerous conservatism.

But as one of the great leaders in the iron industry puts it, a "trust" must not alone aim at progressive reductions in cost, but must also share the economies thus secured with the consumer if it is not to suffer serious checks in its career. It is too early yet to judge whether that policy will be pursued, but it seems the only course to keep competition in bounds.

There is the choice, therefore, of two alternatives in the case of overburdened "trusts": either to hold down selling values so low that it discourages newcomers into the field—and in that case a good many will find it difficult to pay fixed charges and practically impossible to earn dividends on watered stock—or to lead a merry life while favorable conditions last, charge high prices, make large profits, divide earnings, sell out to the public, and let the future take care of the particular industry and everybody and everything connected with it. These are the Scylla and Charybdis of the trusts. There is a channel between the two, but it will take extremely skillful navigators to bring the ship through safely.

And right here we encounter what many consider the most important point in connection with the modern consolidations, and that is the question as to the personality of the leadership. If thus far in our industrial development the one all important point has been efficient, progressive, able management, then the need of it has become infinitely more imperative. Will always the right general of industry reach the command? When he does the huge modern consolidation will be an immediate success, which will last beyond his lifetime. When a man of inferior caliber takes the helm we will witness shipwreck and serious suffering. It may be necessary to rebuild on new lines again and again. Our recent industrial history has in other branches proven emphatically that the danger does exist. When the days of trial do come, and they must, there will be reorganizations. The present consolidation era has not ushered in the industrial millennium. We are the leaders in this new phase of industrial progress, but we have to go through a serious school of experience before we shall have learned to handle effectively this enormously powerful engine of production.

At the conclusion of the paper P. D. Wanner moved that a vote of thanks be extended Mr. Kirchhoff for his paper, and added that the association should feel flattered to have with them the editor of the greatest paper of the iron trade in the world, *The Iron Age*. The vote of thanks was passed accordingly.

Mr. Kirchhoff replied to a question brought out by his statement that export prices were lower than those made the home trade, that he had in mind not the prices of hardware specialties or tools, but those of the heavy lines on which there were international quotations, and in which there was active competition abroad.

Dr. Brown: Is it not the general custom abroad for manufacturers in various lines to have an agreement or understanding among themselves for their own protection and for maintaining prices?

Mr. Kirchhoff: In Germany, France and Belgium arrangements of such a nature do exist. Two sets of prices are in force—one for the home market, and one for the export trade.

P. D. Wanner made a few remarks, saying that he was very glad to hear Mr. Kirchhoff's paper. Few of us, he said, would have been courageous enough to take up the matter of the paper presented, because of the delicateness of the subject. The formation of the "trusts" or, more properly speaking, consolidations, I believe to be a movement in the line of progress. No bad results are to be feared from the various consolidations if they are ably and properly managed.

John Birkinbine also took part in the discussion, say-

ing, in part, that it was a hard matter to talk on—the subject of million of dollars; large sums like these were hard to appreciate, not only in figuring, but in handling. Another subject which I do not understand is that of watered stock, the anhydrous variety is the kind I prefer, and I am all at sea on the watered brand, and think it dangerous. Consolidations to-day eliminate the personality of the constituent concerns, and in many cases the men who have labored long and faithfully to bring the various industries to their present high state of efficiency made the various concerns what they were, and men who should be able and efficient managers are relegated to the rear by the more active managers of financial matters. The individuality of some branches of the trade itself is being lost, to some extent, in the process of combination, and I do not believe the combination of all the iron and steel manufacturing plants is wanted or would be possible. The smaller concerns, having small capitalization, but sufficient for their needs, can continue to do business on an individual basis and have a good chance for success. It will be necessary, however, to take advantage of improvements in methods, &c., to be up to date in every respect and, most important, to keep water out of their stock. Speaking on the question of ore supply, Mr. Birkinbine said that many of the smaller mines could be profitably worked if labor saving devices were employed. Naturally, under the older ways of operating, they cannot compete with ores which are now placed in the market in large quantities, and which have never had a touch of man's hand from the ground to the furnace. A plant with 20 or 30 tons production has naturally a small chance with one whose aggregate tonnage per day is in the hundred thousands, and the same may be said of our furnaces—what chance has the old style 20 or 30 ton daily capacity stack in comparison with the modern producer of 800 tons of pig iron per day?

Still, with modern improvements the small mine and furnace plant can, if their plant is carefully managed, exist, and be operated at a profit. As far as combinations generally are concerned their existence depends largely on their management. The channel of their existence is a dangerous one, but if the man at the helm can safely navigate through the middle course success will no doubt be the result of his efforts.

The meeting then, on motion, adjourned, and the members and guests repaired to the roof garden of the club house, where luncheon was served. Howard Evans, acting as toastmaster, called on a number of those present for informal addresses, which were responded to in a happy manner; after which one of the most successful and pleasant meetings of the associations came to a close.

The Consolidation of the Lima and National Steel Casting Companies.

The Lima Steel Casting Company, Lima, Ohio, whose plant was damaged by fire on February 23, have consolidated with the National Steel Casting Company of Montpelier, Ind. D. E. Harlan, the manager of the Lima plant, goes to Montpelier as treasurer and general manager of the consolidated plants. The officers of the new company are as follows: G. Max Hoffmann, Ft. Wayne, Ind., president; James O'Donnell, vice-president; F. E. W. Scheimann, secretary, and D. E. Harlan, treasurer and general manager. This consolidation practically doubles the capacity of the Montpelier plant, as all of the molders and other employees of the Lima plant have been transferred to Montpelier. The difficulty in securing structural steel decided the directors of these two companies to consolidate, thus preventing a six months' loss of business. The Lima plant was very successful and had established a desirable reputation among the users of steel castings. The Lima plant had recently purchased an entire new equipment, which has been transferred to Montpelier. For the present the Lima plant will remain closed and all contracts will be filled at the Montpelier plant.

F. A. Goodrich & Co., iron and steel merchants of Detroit, have removed their offices to the Majestic Building, in that city.

The Iron Age

New York, Thursday, April 17, 1902.

DAVID WILLIAMS COMPANY,	- - - - -	PUBLISHERS.
CHARLES KIRCHHOFF,	- - - - -	EDITOR.
GEO. W. COPE,	- - - - -	ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS,	- - - - -	HARDWARE EDITOR.
JOHN S. KING,	- - - - -	BUSINESS MANAGER.

Labor Organizations Attempt Too Much.

It is regrettable that it should ever be necessary to allude to a standing conflict between capital and organized labor. It would be much better for all concerned if the relations between employers and employed were of such a character that complete harmony and a desire to work together for each other's benefit should exist. This, however, is not the case. For obvious reasons a state of practical warfare prevails which is stimulated and perpetuated by the aggressions of those whose business it is to endeavor to manage labor interests. It can be safely claimed that employers have not aimed to deprive their employees of rights or privileges. No organization of manufacturers or employers can be found to-day having for its purpose the elimination of any of the rights of their employees. On the contrary, efforts are continually being made by employers to improve the condition of those employed by them, to make their lives more enjoyable and in every way to make them more contented with the conditions which surround them. On the other hand many labor organizations as now constituted are managed as though they consisted of an army in hostile array, formed for the purpose of conducting an active campaign against an equally hostile band consisting of their employers. The condition thus existing is a continual cause of annoyance to an employer, and perpetually keeps him in a state of uncertainty relative to the future conduct of his business. It forces upon him additional anxieties to those which are imposed by the exigencies of business. A manufacturer in these days of strenuous competition finds problems which are sufficiently serious without having the burden of conducting a warfare with his employees. For this reason it occasionally happens that a manufacturer will temporize with a union composed of his workmen and will accept obligations which are of an onerous or unsatisfactory character so that he may to some extent be left free to devote his energies to the management of other details of his business. Such manufacturers take the chances of the aggressions of a union becoming so burdensome as to interfere with the earning capacity of their business. Others, however, are not disposed to permit such an important detail of management to pass from their control and are doing everything at their command to maintain complete authority over those who enter their service. This involves the belief that a continued struggle with their workmen must be endured. They are willing to assume this task, however, rather than find that in the course of time they are seriously handicapped in the great struggle for industrial existence.

It would be far better for all concerned if the great labor organizations should be managed on conservative lines so as to invite to their support the equally great employers of labor. No serious objection prevails in the minds of many large employers to the organization of their workmen in unions. It is often very satisfactory for manufacturers to arrange labor schedules and other

details with representatives of their workmen rather than with the individual, as a great deal of labor would be involved in making separate contracts. If labor organizations were to be maintained for this purpose and their objects would be simply the agreement upon such matters as hours and rates of wages and the settlement of actual grievances, it would seldom happen that a disagreement would arise of sufficient consequence to precipitate a strike or lockout. Questions of this kind could very easily be settled by arbitration.

But labor organizations in these latter days go very much further than this. They assume to regulate many details which properly belong entirely to employers. These details cover such matters as the employment of certain classes of labor, the adoption of piece rates instead of day's wages, the method of handling improved machinery devised for the purpose of increasing output, the establishment of a standard for a fair day's work, the employment of apprentices, &c. When labor unions attempt to pass upon such questions as the limitation of output and the freedom of employing or discharging men, or the employment of apprentices, they invade a field which belongs to those who have invested their capital in a manufacturing plant and who are assuming all the burdens and hazards of conducting such a plant so successfully that it will be able to continue in operation in good times and in bad times, enabling employers to keep the workmen employed and providing a sufficient revenue on the capital invested to warrant the continuance of the business. This is the rock on which labor organizations and associations of manufacturers have split.

The manufacturers, it can safely be claimed, are, as a rule, disposed to recognize the progress of the times, and as far as practicable to arrange working hours and rates of wages to harmonize with the ideas of our advanced civilization. But the manufacturers of America are not yet willing to see the management of their works rest almost entirely in the hands of irresponsible labor leaders, to see their output restricted, to see inefficient men retained in positions merely because they belong to unions, and to see their working force gradually drift into a condition of incompetency. The conflict which has been waged in this country for some years past between large associations of employers and strong unions of workmen has been conducted for the purpose of deciding who shall regulate these questions. This conflict has not been decided definitely, and thus far both parties appear to have gained some prestige in different sections, or in certain branches of manufacture. The impression seems to be entertained in some lines that because all manufacturers in those lines are not united in a great national organization the unions of workmen will therefore be able in future tests of strength to secure a victory. They fail to recognize the wonderful strength of local organizations of manufacturers which have been formed to meet these very conditions. Looking over the labor struggles of the past year, any one familiar with the circumstances can recall that in some of the strongholds of unionism the employers have won decisive victories. These advantages will be maintained, and it can be safely assumed that if other struggles of the same character are precipitated they will be fought with equal determination by the manufacturers. It would be wise on the part of the great leaders of labor organizations if they should recognize this fact and attempt to hold their forces in the future on the conservative platform of endeavoring to settle hours and wages. They should intrust other matters to the regulation of employers.

Our Enormous Steel Production.

Every one connected with the steel industry expected that the statistics of the production of open hearth steel for 1901 would reveal a very large increase. But we question whether many realized how rapid had been the development last year. The American Iron and Steel Association has just published the figures, which we reproduce in detail elsewhere. For convenient reference we present below a table giving the production of Bessemer and open hearth steel ingots for a series of years:

Production of Steel in the United States.—Gross Tons.

Year.	Open hearth ingots.	Bessemer steel ingots.	Total.
1895.....	1,137,182	4,909,128	6,046,310
1896.....	1,298,700	3,919,906	5,218,606
1897.....	1,608,671	5,475,315	7,083,986
1898.....	2,230,292	6,609,017	8,839,309
1899.....	2,947,316	7,586,354	10,533,664
1900.....	3,398,135	6,684,770	10,082,805
1901.....	4,656,309	8,713,302	13,369,611

There has, therefore, been an uninterrupted increase in production of open hearth steel, which has quadrupled since 1895 and which promises to show a further striking development during the current year. We all know with what feverish activity new open hearth steel plants, large and small, are being built all over the country, and what interesting developments are going on in this branch of steel making, metallurgically and mechanically. So far as Bessemer steel manufacture is concerned, no new large plants are under construction, since the great Buffalo plant may be regarded as a substitution for the dismantled Scranton works. Of course Bessemer steel capacity has increased in recent years in spite of this, but this has taken the form of strengthening and remodeling the older works. There are many who confidently assert that open hearth steel is now being made more cheaply than Bessemer metal, but the question of cost is so much dependent upon local and upon passing phases that it is impossible to generalize.

The most striking fact, however, in the figures now available is the tremendous output of steel in 1901, which in all probability will be largely added to during the current year. That this country should since 1895 have more than doubled its output of steel, and should be actually importing foreign metal although making steel at even a greater rate than the 1901 figures reveal, is eloquent proof of its enormous consuming capacity.

Freight Discrimination Stopped.

New conditions are confronting commercial and manufacturing interests as a result of the vigor which has been infused into the Interstate Commerce Commission. The vitality of the statutes of the general Government affecting interstate commerce, which had been supposed to be practically destroyed, has been reawakened by the energy of the President and his legal advisers, and to the surprise of all concerned it is found that sufficient power is vested in the commission to enable that body to compel railroad officials to observe the law. Energetic proceedings instituted by the commission at Chicago and other important points during the past few weeks have put a complete stop to the system of granting rebates to shippers. The intention of the Interstate Commerce act was to compel railroad companies to treat their customers impartially. This was the case, it appears, for only a short time after the act went into effect. So far as this matter is concerned the law has been a dead letter. Its provisions have been steadily violated, and for some years the practice of granting rebates has probably been worse than prior to the passage of the law. The vigorous efforts now being made by the commission to put a stop to this practice have so

impressed the offending railroad officials that it is understood that large shippers having contracts for rebates will lose a great deal of money, as these contracts have summarily been abrogated and will not be carried out. The practice has been stopped of large shippers soliciting bids from railroad companies for the transportation of freight and awarding the business to the largest bidder. At present it is believed that the railroad companies are strictly adhering to their regular rates and are extending favors to nobody. It is claimed that this is operating to the serious disadvantage of the so-called weak railroad lines, which can no longer secure a large share of traffic by making secret rates. It, therefore, is presumed to be greatly aiding the business of so-called standard railroads having shortest lines, best equipment, best terminal facilities, &c. These, however, are matters which do not particularly concern the general manufacturing and commercial interests, who are only affected by the freight rate which they are compelled to pay. Hereafter it is expected that delivered prices on many commodities will be higher, as the railroad companies will no longer be permitted to sacrifice a portion of their freight receipts to secure business over their lines. This has been a very important matter in the past, especially during times of depression. If the Interstate Commerce Commission continue to rigorously enforce the law, the only way in which low rates will be made in depressed times will be by the publication of an open reduction, which will mean equal favors to all shippers. This is simply another illustration of the belief long entertained that the laws of the United States are sufficient to correct any irregularities if properly enforced.

Colonial Steel Company.—The new steel plant of the Colonial Steel Company of Pittsburgh, which has been under erection at Colonia, Pa., for some months, is nearly completed. The puddling department of the plant was finished and put in operation on February 12 last. The crucible, melting and hammer departments were finished later and were started up on April 2. The remainder of the plant, including the rolling mill and rolling mill building, are being pushed to completion and will be in operation prior to July 1 next. The plant of this concern is a modern one throughout, the equipment, buildings and everything pertaining thereto being of the very best construction that money could buy. The company will make a specialty of the manufacture of Colonial Red Star special tool steel, which they are now making and for which they solicit inquiries of the trade. The officials of the Colonial Steel Company are in the Keystone Building, Fourth avenue, Pittsburgh, while branch offices are maintained in New York, Boston and Denver.

The South Chicago Works of the Illinois Steel Company during the month of March beat all previous records and made what is said to be the best average per turn of 52 turns in the Bessemer and rail mill of any works in the world. The blast furnaces produced 102,351 tons, and the Bessemer 80,481 tons, an average per turn of 52 turns of 1547 tons, the best previous record in the Bessemer mill was 78,783 tons, with an average per turn of 54 turns of 1459. The rail mill produced 64,178 tons with an average per turn of 52 turns of 1234 tons, as against 63,253 tons with an average per turn of 52 turns of 1216 tons, the best previous record. For the week ending March 1 one rail mill produced 16,323 tons in 12 turns of 12 hours, an average of 1360 tons per turn.

Under the title, "The Natural Resources and Economic Conditions of the State of Texas," there has been issued a well illustrated volume. It is the report of a special committee of the Merchants' Association of New York, who visited the State by invitation of the Governor and Legislature of Texas in April, 1901.

The Convention of the National Association of Manufacturers.

(By Telegraph.)

INDIANAPOLIS, IND., April 15, 1902.—The seventh annual convention of the National Manufacturers' Association convened here this morning at 11 o'clock in the Hall of Representatives, State House. D. M. Parry of Indianapolis, vice-president for Indiana, called the meeting to order. After prayer by the Rev. T. J. Villers, the address of welcome was delivered by Colonel Hart, Auditor of the State of Indiana, appearing in place of Governor W. T. Durbin, who was unavoidably absent. Mayor Bookwalter in a brief, pithy and happy address also welcomed the delegates to Indianapolis, showering upon them the good will of the people of the city.

Chairman Parry, in presenting Theodore C. Search, president of the association, to the convention, briefly summarized some of the qualities which have endeared Mr. Search to the manufacturers. The president was received with prolonged applause.

After replying to the address of welcome on behalf of the convention and thanking Mr. Parry personally for his eulogistic remarks, Mr. Search read to the delegates his annual report.

The President's Annual Report.

In his annual report—the sixth he has presented—President Theodore C. Search of Philadelphia called attention to the declining exports of American manufactured products, and urged manufacturers not to neglect their foreign customers in this era of extraordinary home demand, lest in times of depression they should find their foreign trade destroyed and no export outlets for the surplus of an overstocked home market.

Reciprocity formed one of the chief topics of the report and the work of the National Reciprocity Convention, which was held in Washington last November under the auspices of the association, was reviewed at length. Mr. Search maintained that the Washington convention was thoroughly representative of the manufacturing interests of the country and its action indicative of the true sentiments of the manufacturers concerning reciprocity. Assuming the doubtful chances of any action on the pending treaties of reciprocity with France and Argentina, he declared that further development of the reciprocal trade idea depended upon the possibilities of special legislation like that for which the proposed concession to Cuba affords a precedent. Mr. Search said:

"The concrete proposition which now confronts us appears to me to about like this: Is it feasible, safe and expedient to undertake to adjust our commercial relation with other nations by means of special legislation, dealing with each particular case, or is it preferable from all points of view to seek the same end by delegating to the executive arm of the Government the power to negotiate international agreements for reciprocal concessions?"

"Our treatment of the Cuba problem furnishes the precedent for the new departure in reciprocity; but while we recognize certain obvious advantages in this plan, we must not close our eyes to the dangers that lie in such a course. We must recognize that such a method of procedure practically invites a continuous tinkering of the tariff, the possibilities of which we can view only with distrust and alarm."

With regard to the proposition to create a new Federal Department, Mr. Search expressed gratification at the progress that had been made toward the passage of the Nelson bill, and urged more energetic personal support of the measure by the individual members of the association.

The principle of direct Government aid to the merchant marine, as embodied in the pending Ship Subsidy bill, was commended to the association as in perfect accord with the declarations of previous annual conventions.

Concerning isthmian canal projects Mr. Search took the position that the people really cared but little whether the Panama or the Nicaragua route should be

chosen, so long as some decisive action should be taken by Congress which would advance the matter to the point of actual undertaking of the construction of an interoceanic waterway.

The pending bills for the reorganization of the consular service on practical business lines were recommended for approval by the association.

Attention of the association was directed to the pending eight-hour bill and the "anti-injunction bill," both of which Mr. Search said very gravely concerned the interests of the manufacturers of the country, and should not be permitted to become laws without having been most carefully considered in their bearing upon manufacturing interests.

What had been done during the year to protect members against the imposition of unconstitutional taxes and license fees under the foreign corporations laws of the various States was reported and members were recommended to resist such discriminating and unjust demands.

The appointment of a permanent Committee on Interstate Commerce Law was recommended as a means of aiding the movement to secure desired amendments of that act.

Commercial education was discussed at considerable length, and Mr. Search recommended that the association should consider the feasibility of organizing a system of examination and certification of commercial students upon their completion of prescribed courses of study, or the establishment of correspondence courses of instruction as alternative plans to meet the prevailing desire for larger facilities for instruction in practical business methods, more particularly those entering into international trade.

Mr. Search discussed with much emphasis the needs of the association as demonstrated by the six years of his presidency. He said that the prevailing prosperity of the manufacturers and the concentration of their attention upon the problems of extraordinary business activity made it exceedingly difficult to command their support of such broad work as that for which the association was formed. The greatest need of the organization was a larger income with which to carry on the increasing volume of work and he advocated the increase of the annual fee from \$50 to \$100.

As a means of increasing the influence and prestige of the association, Mr. Search suggested the holding of semiannual conventions of manufacturers and merchants for the consideration of special topics; such, for example, as methods of extending export trade. He also recommended the subdivision of the work of the association among a number of committees, a plan which he believed would give larger results and tend to strengthen the organization in many ways.

Mr. Search explained that his retirement from the presidency did not mean any relinquishment of his active interest in the association, but was due solely to his desire to be relieved from the arduous work of the position and to the increasing demands of his private business interests.

It is significant that the reference to the Ship Subsidy bill was the first portion of the report to be received with marked demonstration. Mr. Search's impressive reading of the sentence, "There is no mistaking the fixed purpose of our people to have their own ships upon all the seas," called forth a round of applause.

The next part of the report to receive marked approval was in regard to some needs of the association. "I am not an advocate of retrenchment," read Mr. Search. "I believe in expansion, particularly in such a period of universal prosperity." The delegates heartily approved and applauded with vigor the resolution to increase the annual fee from \$50 to \$100.

Before the close of the morning session President Search announced the following committees, the first member named in each case acting as chairman:

Rules and Order: George H. Barbour, Michigan; W. M. Taylor, Indiana; C. W. Asbury, Pennsylvania; Leslie Moulthrop, Connecticut; J. C. Hobart, Ohio; M. H. Tarbox, Massachusetts; Ludwig Nissen, New York.

Credentials: James F. Taylor, Ohio; P. H. Kalbfleisch, New York; C. N. Fay, Illinois; M. R. Gardner, Indiana;

C. W. Pusey, Delaware; Owen Osborne, Pennsylvania; David S. Walton, Connecticut.

Constitution: George T. Coppins, Massachusetts; C. F. Quincy, Illinois; E. B. Pike, New Hampshire; W. T. Tilden, Pennsylvania; F. B. Wiborg, Ohio; F. S. Kretzinger, Iowa; Hamilton Carhart, Michigan; George J. Seabury, New York.

Resolutions: Charles A. Schieren, New York; Charles H. Harding, Pennsylvania; H. H. Hanna, Indiana; J. A. Jeffrey, Ohio; Philetus W. Gates, Illinois; W. H. Withington, Michigan; W. J. Leavenworth, Connecticut; W. M. Pratt, Massachusetts; W. R. Farrand, Michigan; H. S. Kennedy, New York; Oberlin Smith, New Jersey; James Powell, Ohio.

Nominations: Richard Young, New York; Henry C. Atkins, Indiana; W. W. Willetts, Illinois; J. H. Page, Massachusetts; Frank S. Werneken, Michigan; C. R. Hoag, New Jersey; F. W. Snow, New York; Fred. A. Geier, Ohio; Oliver Williams, Pennsylvania; Robert Laidlaw, Ohio; Frank Leake, Pennsylvania.

Upon the reassembling of the convention at 3 p.m., Colonel Barbour of Detroit, as chairman of the Committee on Rules and Order, made a report offering a few simple, practical rules for the guidance of delegates. The committee's report was read and the rules adopted.

The report of Treasurer Charles A. Schieren of New York was read, received and filed. Mr. Schieren recommended that the convention adopt a definite date upon which to close the fiscal year of the association. This led to considerable discussion involving the time best adapted to the holding of the annual convention. After the expression of many diverse views the matter was referred to the Executive Committee.

The report of the International Freight Bureau, by Daniel H. Burdett, manager, was read by Secretary Wilson. The showing was highly gratifying to the association, and the appreciation of the delegates was enhanced by the praise bestowed upon the work by Oliver Williams of Catasauqua, Pa.

The president's report, read during the morning session, was then taken up for discussion. Commercial reciprocity was given attention first. Mr. Seabury of New York was the first speaker. He favored reciprocity, he said, and personally he was ready even for free trade, but he believed that many other manufacturers were not, and therefore he was opposed to meddling with the tariff. He deprecated the attitude and interference of politicians in the matter and hoped to keep politicians at a distance. Reciprocity to some domestic industries would mean destruction or serious loss; they could not compete successfully with foreign manufacturers without reducing labor to a low level, "and shall labor be placed on a low basis in this country? Never."

Other delegates refuting the statement that only manufacturers who have tested the foreign markets can appreciate the situation, called attention to the claim that tariff is the result of barter, and could be readily understood by domestic manufacturers. The view that reciprocity would receive best attention if placed in the hands of the President of the United States was strongly presented.

Mr. Schieren of New York combated with some force the careless statement which had been made belittling politicians and the comprehension of business subjects. He paid a high tribute to the able men in Congress and especially to the members of the Ways and Means Committee of the House. After some telling words Mr. Schieren concluded by thanking God for the able men at Washington. Further remarks were indulged in, but it was subsequently decided to defer further discussion of the subject until after the report of the Committee on Resolutions.

The proposed new Federal department of commerce and industries proved a fertile subject for the convention. Mr. Barbour of Detroit, who has given much time and attention to the matter both at home and at Washington, explained some of the obstacles to the passage of the bill, and some of his resolutions were greeted with applause. He pointed out especially that it is necessary for manufacturers to re-enforce resolutions by personal representation at Washington, to explain details and to answer pointed questions.

President Search expressed deep regret that so many members of the association are too busy to attend the present convention or to go to Washington in the interest of needed legislation. After pertinent remarks by Oliver Williams of Pennsylvania, Oberlin Smith of New Jersey and Frank Leake of Pennsylvania, the discussion crystallized into a motion offered by Richard Young of New York, that the matter be referred to the Committee on Resolutions. Messrs. Barbour of Detroit and Day of Philadelphia, Secretary Wilson of Cincinnati and Charles H. Harding of Philadelphia again spoke to the question, after which the matter was referred to the Committee on Resolutions excepting that on motion of Mr. Barbour the president was instructed to telegraph Mr. Hepburn, at Washington, asking if the Ways and Means Committee of the house will entertain a large committee from the National Manufacturers' Association in favor of the bill creating a department of commerce.

The views expressed by President Search in his annual report on the Shipping Subsidy bill, the Isthmian Canal project and the Consular Service prevailed, each question being taken up separately and indorsed with little or no discussion.

The president cautioned the convention that it would be well to express opinions fully and clearly, as such views would be sent broadcast throughout the country.

Much interest was displayed in the bill providing for the compulsory use of the metric system. Mr. Schieren of New York believed that the adoption of the French system would help export trade, especially as with the exception of England all nations have adopted the metric weights and measures. Walter Wood of Philadelphia thinks the adoption is only a question of time. On the other hand, C. E. Carpenter of Philadelphia, Oberlin Smith of New Jersey, Coleman Sellers, Jr., of Philadelphia and Messrs. Paris and Davis of Cincinnati spoke strongly against the measure. In fact, nearly all manufacturers of machine tools in the convention were either directly or indirectly opposed to making the metric system compulsory in this country. Mr. Egan of the J. A. Fay & Egan Company of Cincinnati, however, expressed views in favor of a gradual adoption of the French system. The question was being warmly discussed when the convention adjourned.

One of the most prominent features of the convention is the interest which centers in the selection of a successor to President Theo. C. Search. At the moment the matter is still in the hands of the Committee on Nominations, but there are four prominent members who are credited with being aspirants: Charles A. Schieren of New York, George H. Barbour of Detroit, M. D. Parry of Indianapolis and C. H. Harding of Philadelphia.

The selection of Richard Young of New York as chairman of the Committee on Nominations is regarded as favoring the nomination of Mr. Schieren. The election takes place on Thursday.

On Tuesday 143 delegates registered, and 64 visitors were accommodated with admission tickets, making a total attendance of 207. The following is a list of the delegates present interested in iron and steel and collateral industries:

Robert C. Haskins, Wardner, Bushnell & Glessner, Springfield, Ohio.
J. A. Jeffrey, Jeffrey Mfg. Company, Columbus, Ohio.
P. A. Myers, F. E. Myers & Bro., Ashland, Ohio.
Charles Arthur Carlisle, Studebaker Mfg. Company, South Bend, Ind.
H. H. Hanna, Atlas Engine Works, Indianapolis, Ind.
Edward H. Sanborn, National Association of Manufacturers, Philadelphia.
William H. Cole, Tower & Lyon, New York City.
E. Huber, Huber Mfg. Company, Marion, Ohio.
R. P. Zent, Republic Iron & Steel Company, Chicago, Ill.
Wm. N. Pelouze, Pelouze Scale & Mfg. Company, Chicago, Ill.
F. S. Werneken, John Brennen & Co., Incorporated, Detroit, Mich.
D. M. Parry, Parry Mfg. Company, Indianapolis, Ind.
H. M. Kinney, Winona Wagon Company, Winona, Minn.
Henry W. Avery, Avery Stamping Company, Cleveland, Ohio.
Harlan P. Marshall, Wyckoff, Seamans & Benedict, Indianapolis, Ind.
Ralph H. Waggoner, Western Department National Association of Manufacturers, Chicago, Ill.
F. B. Gill, Standard Scale & Supply Company, Limited, Pittsburgh, Pa.
F. A. Huber, the Marion Steam Shovel Company, Marion, Ind.
E. P. Wilson, Cincinnati, Ohio, secretary.

C. E. Swaltzbaugh, Toledo Cooker Company, Toledo, Ohio.
 G. W. Thurston, American Screw Company, Providence, R. I.
 S. H. Goodwin, Westcott Chuck Company, Onelda, N. Y.
 Henry B. Lupton, Oliver Iron & Steel Company, Pittsburgh, Pa.
 Wm. M. Taylor, Chandler & Taylor Company, Indianapolis, Ind.
 F. S. Kretsinger, the Iowa Farming Tool Company, Fort Madison, Iowa.
 W. H. Withington, Withington & Cooley Mfg. Company, Jackson, Mich.
 C. G. Rowley, Aspinwall Mfg. Company, Jackson, Mich.
 Philltus W. Gates, Allis-Chalmers Company, Chicago, Ill.
 H. B. Anthony, the McRea & Roberts Company, Detroit, Mich.
 Robert Laidlaw, Cincinnati, Ohio.
 Geo. H. Barbour, Michigan Stove Company, Detroit, Mich.
 James Butterworth, H. W. Butterworth & Sons Company, Philadelphia, Pa.
 Fred. A. Geler, Cincinnati Milling Machine Company, Cincinnati, Ohio.
 James C. Hobart, the Triumph Electric & Ice Machine Company, Cincinnati, Ohio.
 James Powell, the William Powell Company, Cincinnati, Ohio.
 Chas. A. Bookwalter, Mayor, Indianapolis, Ind.
 Theodore C. Search, president, Philadelphia, Pa.
 Thos. Devlin, Thos. Devlin Company, Philadelphia, Pa.
 C. A. Slaker, Deering Harvester Company, Indianapolis, Ind.
 E. V. McCaffrey, McCaffrey File Company, Philadelphia, Pa.
 Chas. A. Schieren, Chas. A. Schieren & Co., New York City.
 Oberlin Smith, Ferracute Machine Company, Bridgeton, N. J.
 W. T. Plummer, Main Belting Company, Philadelphia, Pa.
 Oliver Williams, Bryden Horse Shoe Company, Catsauqua, Pa.
 Chas. W. Asbury, Enterprise Mfg. Company, Philadelphia, Pa.
 Fred. W. Snow, Ramapo Iron Works, New York City.
 Coleman Sellers, Wm. Sellers & Co., Incorporated, Philadelphia, Pa.
 Walter Wood, R. D. Wood & Co., Philadelphia, Pa.
 C. C. Hanch, Nordyke & Marmion Company, Indianapolis, Ind.
 R. L. Dorsey, Tucker & Dorsey Company, Indianapolis, Ind.
 John Loyd, John Loyd Company, Brooklyn, N. Y.
 Charles W. Pusey, the Pusey & Jones Company, Wilmington, Del.
 N. A. Gladding, E. C. Atkins & Co., Indianapolis, Ind.
 W. J. Clark, W. J. Clark Company, Salem, Ohio.
 Jas. A. Coe, James A. Coe & Co., Newark, N. J.
 Geo. T. Coppins, Walworth Mfg. Company, Boston, Mass.
 A. O. Bement, E. Bement's Sons, Lansing, Mich.
 W. D. Dunning, Boomer Boschert Press Company, Syracuse, N. Y.
 M. E. Barber, Piqua Handle & Mfg. Company, Piqua, Ohio.
 H. O. Smith, G. & T. Tire Company, Indianapolis, Ind.
 Marshall Cushing, manager, New York City.
 Aldehase Peet, Syracuse Chilled Plow Company, Syracuse, N. Y.
 L. D. Reynolds, Reynolds & Reynolds, Dayton, Ohio.
 Frank G. Bolles, Bullock Electric Mfg. Company, Cincinnati, Ohio.
 Thos. P. Egan, J. A. Fay & Egan Company, Cincinnati, Ohio.
 H. P. Deuser, H. P. Deuser Company, Hamilton, Ohio.
 Oliver S. Titus, Empire Drill Company, Swartzville, N. Y.
 William Lodge, Lodge & Shipley Machine Tool Company, Cincinnati, Ohio.
 A. O. Silver, Silver Mfg. Company, Salem, Ohio.
 J. W. Porch, Lukens Iron & Steel Company, New Orleans, La.
 D. H. Burdett, International Freight Bureau.
 D. A. Tompkins, D. A. Tompkins Company, Charlotte, N. C.
 P. E. Montannis, Springfield Machine Company, Springfield, Ohio.
 Howard Campbell, Garr Scott & Co., Richmond, Ind.
 Jacob Stephens, William H. Haskell Mfg. Company, Pawtucket, R. I.
 D. S. Walton, National Folding Box & Paper Company, New Haven, Conn.
 Walter S. Barker, A. J. Tower Company, Roxbury, Mass.
 W. J. Leavenworth, R. Wallace & Sons Mfg. Company, Wallingford, Conn.
 Charles F. Bliss, Farrel Foundry & Machine Company, Ansonia, Conn.
 George Royce, Steam Stone Cutter Company, Rutland, Vt.
 S. O. Bigney, the S. O. Bigney Company, Attleboro, Mass.
 N. G. Williams, Vermont Farm Machine Company, Bellows Falls, Vt.
 Frank F. Woods, S. A. Woods Machine Company, South Boston, Mass.
 Henry Fairbanks, E. & T. Fairbanks, and vice-president for Vermont of the National Association of Manufacturers, St. Johnsbury, Vt.
 Thomas Laughlin, Thos. Laughlin Company, and vice-president for Maine of the National Association of Manufacturers, Portland, Maine.
 George C. Pettis, Hoggson & Pettis Mfg. Company, New Haven, Conn.
 E. B. Pike, Pike Mfg. Company, and vice-president of the National Association of Manufacturers for New Hampshire, Pike Station, N. H.
 William M. Pratt, Goodell-Pratt Company, Greenfield, Mass.
 O. S. Titus, Empire Drill Company.
 W. P. Cotharin, New England office, National Association of Manufacturers, Boston, Mass.
 George T. Coppins, Walworth Mfg. Company, and vice-president for Massachusetts of the National Association of Manufacturers, Boston, Mass.
 I. H. Page, J. Stevens Arms & Tool Company, Chicopee Falls, Mass.

The Bessemer Foundry Company.—The Bessemer Foundry Company, with works at Grove City, Pa., man-

ufacturers of gas engine castings and gray iron castings, have begun operations and will take off their first heat April 4. The officials of this company are Benj. Spearman, president; A. Seaton, vice-president; W. H. Christy, secretary, and J. M. Albin, treasurer and general manager.

The Old Valley Furnace Consolidation.

An echo of the old project of consolidating the furnaces of the Shenango and Mahoning valleys has created some stir through a sensational report in some of the daily newspapers which expanded the affair into an accomplished \$200,000,000 consolidation. On the furnace consolidation work has been done for a long time by Joshua Rhodes of Pittsburgh, and E. N. Ohl of New Castle, Pa., prominently connected with furnace interests in the Shenango Valley. At one time there was a movement to include a number of rolling mills, but the aggregation thus brought into the scheme had a decidedly deterrent effect on the owners of furnace properties.

In its details the report as issued is incorrect, and was published without the authority of Blymyer, Nobbs & Clarke, who have been acting as attorneys for those interested for some months. A considerable number of the concerns mentioned as being parties to the consolidation have denied any connection with it. In fact, for the present the scheme, even in its greatly modified more recent form, has been dropped. As a matter of fact options were obtained from the following plants:

Stewart Furnace, Sharon, Pa., Stewart Iron Company.
 Sharpsville Furnace, Sharpsville, Pa., Sharpsville Furnace Company.
 Cherry Valley Furnace, Leetonla, Pa., Cherry Valley Iron Works.
 Fannie Furnace, West Middlesex, Pa., Cherry Valley Iron Company.
 Claire Furnace, Sharpsville, Pa., Claire Furnace Company.
 Mabel Furnace, Sharpsville, Pa., Perkins & Co., Limited.
 Grace Furnace No. 2, Youngstown, Ohio, the Brier Hill Iron & Coal Company.
 Tod Furnace, Youngstown, Ohio, Youngstown Steel Company.
 Mattie Furnace, Girard, Ohio, Girard Iron Company.
 Dunbar Furnaces, Dunbar, Pa., Dunbar Furnace Company.
 Etna Furnace, Pittsburgh, Clinton Iron & Steel Company.
 Rebecca Furnace, Kittanning, Pa.
 River Furnace, Cleveland, Ohio, River Furnace & Dock Company, lessees; Cleveland Iron Company, owners.
 Sarah Furnace, Ironton, Ohio, Kelly Nail & Iron Company.
 Etna Furnace, Ironton, Ohio, Marting Iron & Steel Company.
 Belfont Furnace, Ironton, Ohio, Belfont Iron Works.
 Ashland Furnaces, Ashland, Ky., Ashland Coal & Iron Railway Company.

The options on some of these furnace properties expired on April 1, and those on the others terminate on May 1. To all intents and purposes the undertaking is dead.

The Active Blast Furnace Capacity.

A serious typographical error crept into the monthly report of the blast furnace capacity in operation on April 1, published in *The Iron Age* April 10, page 25. As stated the active coke capacity was 331,140 gross tons and the charcoal capacity 6284 tons, as shown in detail correctly in the respective tables. In the report of the total capacity in the United States the figure given was 377,424 tons. It should have read 337,424 tons. On March 1 the coke iron capacity was 316,039 tons and the charcoal capacity 6989 tons, a total of 323,028 tons, an increase of 14,396 tons during the month.

Testing Steam Gauges.—The American Steam Gauge & Valve Mfg. Company, 8-36 Bismarck street, Jamaica Plain, Boston, Mass., issue a circular referring to the importance of testing and examining steam gauges, and state that some parties at regular intervals have their gauges examined. This concern refer to the fact that they possess superior facilities for making steam gauges, which are tested by an open mercury column, and that they solicit orders for repairing and testing old gauges of any make, which generally are equal to new when completed, at much less cost than new gauges. They also have facilities for repairing indicators, revolution counter clocks, pop, safety and water relief valves of any make.

OBITUARY.

JOSEPH RICHARDS.

Joseph Richards, the well-known Philadelphia metallurgist, was born in Stowbridge, near Birmingham, England, in 1840, and in his youth was a machinist in Chance Bros.' chemical works, where his father was a departmental superintendent. He studied chemistry at the Midland Institute, Birmingham, where he heard lectures from Hofmann. One of his classmates was Joseph Chamberlain, now Great Britain's Colonial Secretary. Later he was in partnership with his father as manufacturing chemist, making copperas, blue vitriol and ammonia salts from gas liquors. In 1871 he came to America, intending to take charge of a plant for working the gas tar liquors of the Chicago gas works, but the day before he was to start West the great Chicago fire wiped out the whole plant. Finding himself in Philadelphia he started to rework the waste dross from galvanizing pots, and soon built up a large business, refining as much as 3000 tons a year. His process was



JOSEPH RICHARDS.

patented and depended upon the treatment of the dross with sulphur vapor at a red heat, whereby most of the iron was sulphurized while the rest sank to the bottom as an iron zinc alloy. Later the Delaware Metal Refinery was incorporated to work this process and also to reduce waste oxides of lead and tin and to manufacture solders. A specific gravity balance, to test the grade of lead tin solders, was devised by him and is now in almost universal use in the solder trade. It is described in the Journal of the American Chemical Society, May, 1899. Later the firm were one of the first to commence the manufacture of tin and terne plates, and Mr. Richards devised an ingenious balance for determining the amount of coating on specimens of such sheets. Since 1885 he was deeply interested in the production and possible uses of aluminum. He found out many uses for the metal when the cost of the metal with which he experimented—\$8 per pound—made the application then impracticable, but which have since come into general use. He patented the use of aluminum in deoxidizing and refining zinc and brass; also its use in small quantities in galvanizing pots. He devised and patented the most successful solder for aluminum which has yet appeared, a solder which has been in use ten years here and in Europe, and was awarded the John Scott Medal of the Franklin Institute. He had

large experience in remelting, handling and working aluminum; his hard, light alloys of aluminum with zinc are now in general use. Much of his experience in handling and treating white metals and their wastes is embodied in two communications to the Journal of the Franklin Institute, June and July, 1901. He was an active member of the latter institution, having been president of the metallurgical section and vice-president of the chemical and electrical sections; was also an interested attendant at the meetings of the Philadelphia Section of the American Chemical Society. Besides being well known in the zinc, lead, tin and aluminum industries, he had a wide circle of most intimate and cherished friends, for to know him was to admire his equable and genuine character and to become attached to his attractive personality. He died in Philadelphia March 22, aged 62. His only son is Prof. Joseph W. Richards of Lehigh University, the well-known writer on aluminum.

WILLIAM R. SNEAD.

William Reynolds Snead, president of The Snead & Company Iron Works, manufacturers of structural and ornamental iron work, of Jersey City, died suddenly at his rooms, 17 West Thirty-fifth street, New York City, on March 27, in his forty-first year. He was born in Louisville, Ky., and was a graduate of the Massachusetts Institute of Technology. Mr. Snead had many warm friends and a large acquaintance throughout the country. The Snead concern were founded in 1848 at Louisville, Ky., by Charles S. Snead, Sr., who is now in his eighty-third year, enjoying a hale old age, having retired from business. He was one of the pioneers in introducing the use of cast and wrought iron for building purposes. Some years ago the firm were incorporated in Kentucky under the style of The Snead & Company Iron Works. In 1898 the shops were burned to the ground and the business was transplanted to Jersey City, with William R. Snead at the head as president. Mr. Snead was a master of the business, both technically and commercially, having gradually gone through all of the departments after the time of his graduation from college. To those who knew William R. Snead he was ever the sincere, self sacrificing, true and honest character, and most attractive and winning in disposition. He died at his post, so uncomplaining that those near him did not realize his condition.

NOTES.

WILLIAM F. PROCTOR, vice-president of the Singer Mfg. Company, died on April 8 at the Plaza Hotel, New York, after a brief illness, aged 76 years.

LESTER M. BIGGS, president and general manager of the Biggs Boller Company, Akron, Ohio, died suddenly last week. Mr. Biggs was 60 years of age. He organized the J. C. McNeil Boller Company, the Summit City Boller Works and the Biggs Company.

FREDERICK W. TROEMNER of the firm of Henry Troemner, manufacturers of scales, died of heart disease on April 3, at his home in Germantown, Pa.

THOMAS THOMAS of Parryville, Pa., well known in the Pennsylvania iron trade, died suddenly from apoplexy on April 12, while in Allentown, Pa. Mr. Thomas was 74 years of age and since 1867 had been connected with the Carbon Steel & Iron Company.

WILLIAM J. BAXENDALE of the firm of T. R. & W. J. Baxendale, manufacturing machinists, of Troy, N. Y., died on April 1 at St. Mary's Hospital, in that city, as the result of an automobile accident, aged 49 years.

FREDERICK G. COGGIN, who was superintendent of the stamp mills of the Calumet & Hecla Mining Company for many years, is dead.

No. 1 Crane Furnace of the Empire Iron & Steel Company of Catasauqua, Pa., was blown in on Sunday last after having been completely remodeled at a cost of nearly \$100,000, Frank C. Roberts & Co. of Philadelphia being the consulting engineers. The capacity of the furnace will be 175 tons per day. There have been added to the equipment 1500 horse-power of Maxim boilers and three new 80-foot Roberts stoves.

MANUFACTURING.

Iron and Steel.

The Burns Uniform Steel & Metallic Company, 415 Lewis Block, Pittsburgh, propose to erect a plant at Latrobe, Pa., for the manufacture of crucible steel under a new process.

The Hager Steel & Iron Company have about completed their new rolling mill at Madison, Ill., and expect very shortly to have it in operation.

The Woodward Iron Company of Woodward, Ala., will build an additional blast furnace.

B. L. Berkey, president and general manager of the B. L. Berkey Machinery Company, El Paso, Texas, and others are organizing a company to erect in Southern New Mexico a furnace for the production of cast pig for foundry work.

The Hillman Land & Iron Company, St. Louis, Mo., have put both of their furnaces at Grand Rivers, Ky., in thorough repair and have blown in one of them. It is now operating very successfully and is making about 60 tons of foundry iron per day. Besides the furnaces the company own about 75,000 acres of land, and intend in the near future to erect coke ovens to supply coke for the furnaces and to build 15 miles of railroad to connect their ore lands with the furnaces. It is not the intention of the company to put the second furnace in blast until the coke ovens are completed and the ore lands sufficiently developed to furnish an abundant supply of ore.

It is stated that Henry Hewitt of Tacoma, Wash., who owns extensive coal mines and coke ovens about 30 miles from that city, will erect a 200-ton furnace, to be supplied with iron ore from the British Columbia islands, large bodies of which he has secured by option and by purchase.

The Franklin Steel Company of Boston have arranged to establish a Western branch at Chicago Heights, Ill. The company manufacture steel horseshoes and toe calks, and will at once begin the construction of their plant, which will include a rolling mill. Several buildings will be erected, among which will be a one-story structure, 150 x 400 feet, for the rolling mill, and another, 125 x 500 feet, to contain the machine shop, hammer shop and furnaces.

J. J. Gray, Jr., of Sheffield, Ala., has purchased Rockdale Furnace, at Rockdale, Tenn., which he is having repaired preparatory to putting in blast early in June on foundry iron. The furnace is 12 x 54 feet and has a capacity of about 50 tons per day. Mr. Gray is at present connected with the Sloss-Sheffield Steel & Iron Company, but will sever his connection with that company May 1, when he will go to Rockdale and assume the management of the furnace in person.

Frank B. Drake of San Francisco, Cal., has completed the purchase of equipment and is now buying material in Cleveland for the Reliance Bolt Works, who will shortly commence operations in San Francisco, manufacturing set screws, cap screws, tire bolts and other specialties. They have secured a site and are awaiting the equipment of machinery, which is being built by the Acme Machinery Company, Cleveland.

The Vulcan Crucible Steel Company of Pittsburgh, who recently built a crucible steel plant at Alliquippa, Pa., are drawing plans for a rolling mill and open hearth furnace to be added to their works. The concern are now manufacturing crucible tool steel.

The Monarch Iron & Steel Company, who have been incorporated with a capital of \$100,000 and who will build a plant to adjoin that of the Parkersburg Iron & Steel Company at Parkersburg, W. Va., will manufacture planished iron sheets under the patents of G. C. Broomall of Parkersburg, which are claimed to be equal to the Russian process. The officers of the company are S. M. Nease, president; E. M. Whitto, secretary, of Pittsburgh; G. Broomall, treasurer, and J. R. Rose, general manager, of Parkersburg. The plant will be in partial operation on May 1.

McCance Brothers Company of Pittsburgh, recently incorporated with a capital of \$50,000, have built a new galvanizing plant in Pittsburgh and expect to start it this week. The building is 110 x 60 feet, to which a 50-foot addition is being built, and contains a 40-ton hot kettle and two cold tanks, a drying oven and a No. 2 Bliss combined punch and shear. The company have also erected adjoining their plant a 50 x 60 foot warehouse to carry a full line of merchant bars, hoops, bands and black and galvanized sheets.

At Pittsburgh Jones & Laughlins, Limited, are adding two 25-ton acid open hearth furnaces to their Soho plate mill. These, with the two furnaces already embraced in this plant, will give an output of from 180 to 200 tons of steel a day. Jones & Laughlins are turning out at their Soho plant about 300 tons of plates per day. The Talbot open hearth furnace being built by this concern at their South Side mills will soon be ready. The mechanical operation of the furnace has been tested and found to work very nicely. It is expected that this furnace will start early in May and will turn out about 300 tons of steel per day. Eventually it is hoped to get the output up to 500 tons per day. Should the steel prove satisfactory it is likely Jones & Laughlins will install a second Talbot furnace, as the firm are in need of more steel for their finishing mills.

General Machinery.

The Hartford Board Company, Hartford, Conn., of whom E. C. Walker is the president, have had plans prepared for rebuilding the plant at Dutch Point recently destroyed by fire. The new buildings will be of brick and stone, 40 x 154 feet, two stories in height, and 40 x 50 feet, one story high. They will have gravel roofs, with skylights, lift, &c. The power plant will be renovated and the buildings equipped throughout with modern machinery. The entire cost will be in the neighborhood of \$25,000.

The Automatic Machine Company, Bridgeport, Conn., designers and builders of automatic screw and worm threading lathes and automatic threading machinery, are building a two-story addition to their plant to take care of their increasing business. The enlargement is more to accommodate the present tools than to make place for new, so that practically no new machinery will be required.

The Southern Supply Company, Mobile, Ala., have just added to their regular business of railroad and mill supplies oil well machinery and supplies. In oil well machinery they represent the F. C. Austin Machinery Company, Chicago, Ill. They have recently sold well drilling outfits and pipe to the Mobile Development Company, who are now boring for oil at Citronella, Ala., and to the Tom Bigbee Oil & Gas Company, who will before the end of April begin operations at Jackson, Ala. They have also commenced to contract for the installation of oil burning appliances, and have already fitted up four boats and made contracts with the Virginia-Carolina Chemical Company, Charleston, S. C., for some of their plants. The company use a system of their own design in connection with the Juvenal oil burner, for which they have the exclusive control for the States of Alabama, Florida, Georgia and South Carolina.

The Alabama Iron Works, Mobile, Ala., who commenced business and were incorporated under the State laws of Alabama about two years ago in a building 90 x 30 feet on Commerce, between Church and Theatre streets, have found it necessary to have a greatly extended plant, and are now erecting a number of buildings near their first location. The main building is 100 x 62 feet, having two floors. On the first floor will be the machine shop and office, and on the second the pattern shop and pattern warehouse. The entire building will be electrically lighted, steam heated and equipped with a 25-ton crane for transmitting work to the different machines. There will be a three-rail track on the first floor, accommodating both narrow and broad gauge, which will traverse the entire length of the building. A 50 horse-power engine located at the rear end of the building will transmit power required for the complete working of all the machinery. The foundry building, which is 75 x 40 feet, is near the rear of the main building. The furnace will have a capacity of 10 tons, so that castings of almost any weight and dimensions may be undertaken. The boiler, with copper and brass shops, are combined in a building 250 x 70 feet, and are being fitted with the latest machinery for the manufacture of marine and stationary boilers. The leading lines manufactured are saw mills, marine machinery and boilers. The president of the company is Murray Wheeler; secretary and treasurer, F. Tuttle, and manager, Phil. Wittman.

The Double Truss Cornice Brake Company, 1453 Niagara street, Buffalo, N. Y., manufacturers of double truss cornice brakes, beaders, &c., have incorporated under same name, with a capital stock of \$75,000, and intend either to enlarge their present plant or erect a new one in the near future. The officers are Hugh Falconer, president; F. H. Silk, secretary and treasurer, and John H. Crocker, general manager.

The N. A. Lombard Company, 64 School street, Worcester, Mass., who recently absorbed the William H. Eddy Company, have effected a consolidation of the two plants under one roof, and are steadily increasing their output of turret machinery for all purposes and foundry molding machines.

The Southern Car Mfg. & Supply Company, Beaumont, Texas, have incorporated for the purpose of manufacturing railroad cars, rice machinery and other specialties. J. A. Wiggs, Jr., is president.

The Wells Brothers Company, Greenfield, Mass., manufacturers of taps and dies, screw plates, screw cutting machinery and tools, have broken ground for the erection of a fire proof addition, 40 x 125 feet, to their plant, which will be used for offices and stock room. This addition will increase the floor space of the factory to 40,000 square feet, and will give additional room for machinery which they are installing and which will add materially to their facilities for manufacturing. The company report the outlook for business for the coming months to be very good, with prospects for the same increase in business during the present year as they have had in past years.

The Middletown Machinery Company, Middletown, Ohio, are in the market for a 6-foot horizontal boring mill. Business with them has increased to such an extent during the past two years that they have decided to build a new plant with three times the capacity of the present one.

The recently organized Ulley-Smith Machine Company, P. O. Box 852, Spokane, Wash., are in the market for a 24 x 24 inch by 5 foot planer and a 24-inch lathe for their new shops, which they are equipping for the manufacture of small automatic high speed engines, dynamos and motors and for general machine work. Most of the equipment has been secured from

the Marshall & Huschart Machinery Company and the Bullock Wagner Electric Company. The firm are composed of John D. Ulley, formerly with the Spokane Iron Works, and W. J. Smith, formerly with the Union Iron Works.

Charles H. Besley & Co., 10 and 12 North Canal street, Chicago, have within the past week made shipments of their Gardner grinders to Oregon, Wisconsin, Connecticut, New York and Massachusetts. They are further receiving numerous orders from agricultural implement manufacturers for their Badger and Bonanza oil cups, and are making liberal shipments of Helmet oil to all parts of the country. They report their small tool business very good, the trade in tools and supplies coming from every section of the Union.

The G. H. Hammond Company, Chicago, Ill., packers, will erect a new machine shop 48 x 70 feet. See Bridges and Buildings.

The machinery and mill supply jobbing house of Forbes, Liddell & Co., Montgomery, Ala., have been succeeded by the Liddell Machinery & Supply Company, recently incorporated with a capital stock of \$25,000. The business will be continued along the same lines as heretofore.

J. Thompson & Sons Mfg. Company, Beloit, Wis., founders and machinists, have incorporated under same name. They built a new plant last year across the State line in Illinois and found it advisable to incorporate in that State.

In these columns last week error was made in the address of the Soule Steam Feed Works. They are located at Meridian, Miss.

A. L. Moore of Cleveland, president of the Cleveland Machine Screw Company, is about to embark in the manufacture of motor vehicles on his own account. He proposes to produce a light gasoline runabout weighing from 750 to 900 pounds and selling at a reasonable price. He has secured factory location and is purchasing material with a view to embarking in the business on quite an extended scale.

The Western Ohio Railway Company of Cleveland have decided to establish large car barns and repair shops at Wapakoneta, Ohio. Four buildings will be erected.

The Bigelow Company, New Haven, Conn., are building an addition, 46 x 85 feet, to their plant, to be used as an office and an addition to the machine shop.

The Macomb Sewer Pipe Company, Macomb, Ill., are in the market for about \$30,000 worth of equipment and building material for the improvements they are to make to their plant. These will consist of an immediate overhauling of the plant, doubling the size of the main building and increasing the kiln capacity in a like manner. A car line will be built about 2 miles to the company's clay mines.

Complete equipment will be required by the Coshocton Tool Company, Coshocton, Ohio, who are to erect a plant for the manufacture of shears, punches, tools and other machine tools at a cost of about \$25,000. The company have been organized by substantial men of that city and will be incorporated with a capital stock of \$50,000. They expect to have the plant built and ready for operation by July. D. A. Raliff and S. C. Harvey of Cambridge, Ind., are interested. Address communications for the present to the Coshocton Board of Trade.

It is reported that the business of the National Machinery Company of Tiffin, Ohio, manufacturers of the National heading, upsetting and forging machinery, has been transferred to a company of the same name incorporated under the laws of New Jersey. It is understood that the new corporation will enlarge the plant and push the business. The directors and officers of the new company are M. Frost and E. R. Frost of Toledo, H. N. Reynolds and Eugene Barney of Dayton, Lewis Selle, Amanda Betts, George Schroth, Augusta Rohl of Tiffin, and Francis B. Lee, Trenton, N. J. Officers: Lewis Selle, president; H. N. Reynolds, vice-president, and A. Betts, treasurer.

The Winton Motor Carriage Company, who are preparing to erect a large automobile plant in Cleveland, have completed plans for same and will shortly let contracts for the buildings and a large amount of additional machinery which will be required. There will be three buildings instead of one large one, as originally planned. The main shop, which will include office, carpenter shop, pattern shop, paint shop and shipping department, will be 400 x 100 feet. The machine shop will be 300 x 100 feet, while the brass and iron foundry will be 100 x 100 feet. It is claimed the plant will have a capacity of 20 vehicles per day. A novel feature will be that all machinery will be operated by the standard Winton double cylinder gasoline engines, developing about 15 horse-power each. A certain number of new machines will be kept belted to the shafting at all times. After they have been thus tested for a certain number of days they will be placed in vehicles.

The Thomas & Lowe Machinery Company, Providence, R. I., will remove May 1 to larger and more commodious quarters in the Fuller Building, Sabine and West Exchange streets, where they will carry a much larger stock than formerly, adding several new lines.

Boilers and Engines.

The National Engine Company, Rockford, Ill., have been incorporated, with a capital stock of \$65,000, to manufacture

gasoline engines and machinery. The incorporators are Levin Faust, T. Leon, D. Tassandler and J. A. Landstrom.

The village of Columbus Grove, Ohio, is advertising for two horizontal compound duplex pumping engines and one 150 horse-power boiler. Charles Killen is village clerk. The village has also passed an ordinance authorizing an issue of \$15,000 worth of bonds for the purchase of a municipal lighting plant to be operated in connection with the water works.

The city water works department of Mansfield, Ohio, are advertising for proposals on a new boiler and an air compressor. Wm. Jarrett is purchasing agent.

On May 5 the town of New Bremen, Ohio, will decide on a proposition to issue \$35,000 worth of bonds for a water works plant and \$15,000 worth of bonds for a municipal lighting plant. Citizens are in favor of the measures.

The Peru Foundry Machine Shops & Boiler Works, Charles Brunner, proprietor, Peru, Ill., have completed a new boiler shop, foundry and building for the manufacture of gasoline engines, farm scales and air compressors, all equipped with modern appliances. These three buildings contain about 50,000 square feet of floor space and will double the present capacity of the plant.

The Clark Engine & Boiler Company, Kalamazoo, Mich., are having a phenomenal demand for their engines and boilers and are fully ten months behind orders. The company have recently nearly doubled their output by equipping their plant with a full line of air tools, such as air drills, riveters and a large air compressor, in addition to which they have added a large flanging machine, an extra large planer, universal radial drill, Hartford slotting machine, boring machine, new improved drilling machines, &c.

Strahle & Swain, Mobile, Ala., who commenced business as manufacturers of steam boilers, tanks, smoke stacks, &c., in October last at the corner of East Water and South Eslava streets, have had a new building of their own erected at the foot of South Eslava street, upon which they entered in February. It is 50 x 40 feet. They had an abundance of work until within a short time, when it fell off. Orders are, however, again coming in more freely.

The Union Iron Works Company, Selma, Ala., were formed in 1885 by the combination of the firms of Gregory, Coe & Pollard and that of Brooks, Tyler & Barker, each of whom had been conducting a machine shop for some years in Selma. The company were incorporated at time of formation under the State laws of Alabama. They manufacture engines and boilers and also live rolls and logging cars, the rebuilding of locomotives being their specialty. They have contracted to furnish the machine work and castings for a large lot of pressers and gins for the Fort Valley Gin Works, Fort Valley, Ga., and a duplicate order for the Smith Palmore Machine Company, Tyler, Texas. They are rebuilding a locomotive for the Yellow River Railroad Company, Laurel Hill, Fla.; another for the Smith Lumber Company, Sumter, Ala., and a switch for the Shoal Creek Lumber Company, Nadawah, Ala. They have also contracts with the Southern Railroad Company to supply all locomotive and car castings required on their Mobile and Birmingham divisions.

The Rollins Engine Company, Nashua, N. H., builders of automatic steam engines, will build a 65-foot addition to their main shop, in which will be installed a large traveling crane. All needed equipment has been purchased.

The G. H. Hammond Company, Chicago, Ill., packers, will erect a new power house, 123 x 162 feet. See Bridges and Buildings.

The Ridgeway Mfg. Company, Ridgeway, Pa., manufacturers of boilers and engines, inform us that the principal loss in their recent fire is on the building and the water damage to machinery. The latter will be repaired, so there will be no new machinery required for the present.

Garren & Hines, Muscatine, Iowa, boiler makers, will build a new shop, 40 x 70 feet, into which they will move their machinery from their present one, which has become too small for their business.

The Keystone Valve & Mfg. Company have been organized at Pittsburgh with a capital of \$10,000. The concern will make a specialty of the manufacture of a new steam valve patented by Harry Keyes of Homestead, Pa.

Foundries.

The Weatherby Foundry Company, Hazleton, Pa., have selected a committee to increase the capital stock of the company and to decide upon improvements to be made to the plant this summer.

The Peacock Iron Works, Selma, Ala., were established in 1865 by George Peacock. At first he did a general foundry business, mostly in the line of architectural iron work. Selma is noted among Southern cities for the artistic character of the fronts of its stores and the verandas of its private dwellings, the credit of which belongs to Mr. Peacock. In 1867 he invented and patented an equally cooled car wheel which was said to be the best chilled wheel up to that time. Later he invented a self oiling car wheel which became his staple manufacture, as it came to be used in all parts of the country. This led him to manufacture small cars of all kinds, comprising coal, oil, phosphate and

other mining cars, as well as cars for sugar plantations, logging railroads and dump cars. Mr. Peacock died three years ago, the business coming into the hands of his two sons, G. H. and W. R. Peacock, who had been given a thorough training in it under their father. Since being in their possession the business has been greatly increased. They have recently purchased ground adjoining their works, with the view of making extensions as soon as the pressure of business will admit. They have their own water works and electric plant and the works are equipped with compressed air. They have just closed contract for the entire iron work in an oil mill at Jackson, Miss., also one at Little Rock, Ark., and one in Selma, Ala. Trade is done from Maryland to Mexico and Arkansas to Cuba.

Curtin & Butts, founders, Alexandria, Va., have incorporated their business under the style of Alexandria Iron Works.

The Variety Iron Works Company, Seattle, Wash., are erecting a new foundry near the Moran Brothers' Company's shipyard. The foundry will have a main building 80 x 100 feet, with a wing 20 x 30 feet.

George H. Smith Steel Casting Company, Milwaukee, Wis., are rapidly completing plans for the rebuilding of their works, which were destroyed by fire several weeks since. It is the intention of the company to push the erection of the new plant as speedily as possible.

Jay H. Newbury, Goshen, N. Y., manufacturer of iron pipe fittings, gray iron castings, &c., is building an addition to his foundry 26 x 120 feet.

The recently incorporated Sharp Mfg. Company, Albert Lea, Minn., have taken over the plant of J. G. Sharp, which they will enlarge by the erection of a new foundry, 24 x 50 feet. The company will manufacture wind mills, tanks, oilers, gasoline engines and will do general foundry work.

The annual meeting of the stockholders of the Seaboard Steel Casting Company was held at Chester, Pa., April 14. Joseph Wharton, Isaac H. Clothier and Morris L. Clothier of Philadelphia, William C. Sproul and John B. Roach of Chester, Thomas H. Savery of Wilmington, Del., and J. Henry Cochran of Williamsport, Pa., were elected directors. William C. Sproul was re-elected president, J. W. Cochran secretary and treasurer and S. E. Sproul general manager.

Bridges and Buildings.

E. W. Sproul, Chamber of Commerce Building, Chicago, Ill., has been awarded a contract for the construction of the great packing plant for the G. H. Hammond Company at the Union Stock Yards, Chicago. The plant will embrace six large buildings and will cost \$2,000,000. These buildings are as follows: Slaughter house, five stories, 113 x 224 feet; oleomargarine and butterine building, five stories, 113 x 114 feet; smoke house and lard refinery, four and five stories, 130 x 194 feet; tank building, four stories, 76 x 130 feet; power house, one story, 123 x 162 feet; machine shop, one story, 48 x 70 feet.

The Pueblo Bridge Company, Pueblo, Col., have incorporated, with a capital stock of \$10,000, for the purpose of constructing bridges, the material for which will be purchased in the East. The incorporators are Fred. H. Bullen, H. L. Hollister and M. E. Bullen.

The contract for the construction of the World's Fair Machinery Building at St. Louis, Mo., has been awarded to Smith & Eastman of Chicago for \$496,957. It is one of the largest structures in exhibit group of the exposition, the dimensions being 525 x 1000 feet. The power plant will be housed in this building, which will be served by a gigantic travelling crane and by two tracks running through the structure from east to west. The firm have also secured the subcontract for the staff work on the Textiles Building from Dunnavent & Estel.

The New England Structural Company of Boston, Mass., have been awarded the contract for furnishing the steel frame work for a machine shop 75 x 150 feet, three stories, for the Jones & Lamson Machine Company, Springfield, Vt. Francis W. Wilson is the engineer and architect.

Six of the nine bents of the Fore River Ship & Engine Company's new steel ship house at Quincy, Mass., being completed, the structure was brought into use last week. Three of the travelling cranes which are to serve it are in place, and the fourth is ready to be hoisted into position. The completing of the remainder of the ship house continues without interruption, while the construction of the battle ships "New Jersey" and "Rhode Island" has been started amidships and will go toward the bow. It is expected that before the forward parts of the vessels are sufficiently under way to leave the travelling cranes free a part of the time the rest of the ship house will be finished, and the building of the vessels can be carried from amidships toward the stern. Two gravity railroads connect the ship house with the various shops of the Fore River workmen. The company have signed the contract to build a new iron structure, with a 100-foot draw, in place of the old Weymouth Fore River Bridge at Quincy Point, Mass. The old wooden bridge was constructed early in the last century and is one of the most famous in the State.

Fires.

The National Iron Works, Sanford street, Brooklyn, N. Y., were destroyed by fire April 14.

The building at West Washington and Canal streets, Chicago, Ill., occupied by the J. H. Dawson Machinery Company, John Wishard Machine Works, Rhodes Watch Tool Company, Connell & Bennett Metal Company and the Eureka Iron Company was damaged to the extent of \$10,000 by fire April 9.

The sulphite mills of the Cumberland Paper Mills, Cumberland, Md., was destroyed by fire April 13. The loss is about \$75,000, partly covered by insurance.

The powder plant of the Austin Powder Company at Glen Willow, a few miles from Cleveland, Ohio, was wrecked April 9 by the explosion of nearly 3000 pounds of powder.

The Southern Plow Works and the Columbus Iron Works, occupying the same building at Columbus, Ga., were destroyed by fire April 10. The loss to the plants is estimated at nearly \$200,000.

Hardware.

Wallis, Robinson & Co., Chicago, Ill., manufacturers of the invincible wedge plate hammer, Dunlap's patent, advise us that the demand for this line has been excellent during the winter and spring. They now make the hammer in three styles, No. 11½ bell face, adze eye, and Nos. 1½ and 1, plain face. Nos. 11½ and 1½ weigh 1 pound and 7 ounces, and No. 1 weighs 1 pound and 13 ounces. They advise us that despite the guarantee they place on these goods—namely, that the heads will not pull off nor the handle break within the length of the wedge plate in ordinary use, they have had less than two dozen hammers returned to them from all causes during the past year.

The Cleveland Wire Spring Company are enjoying an unusually brisk trade in their wire spring and sheet metal departments, and even with many improvements they are crowded with orders. They are filling some large orders for their improved steel barrels and boxes, and, in fact, are behind with their orders to such an extent that new machinery will be installed within a few weeks that will double their present output and put them in a better position to make more prompt deliveries. A new addition to the sheet metal department of 1500 square feet of floor space will be entirely taken up in manufacturing their Never Drip steel mortar and brick hods.

Judd & Leland, Clifton Springs, N. Y., manufacturers of bicycle pumps and sundries, a full line of plated tinware, sprayers, cake tins and leather cup valves of all kinds, as well as leather, rubber, asbestos and special packings, have incorporated their business under the style of Judd & Leland Mfg. Company.

The Ohio McCloskey Wire Fence Company will be shortly incorporated with a capital stock of \$100,000. The general offices will be in Toledo. George U. Roulet, James P. Davey and H. H. Hunter have secured the State rights for ten States for the exclusive sale of the McCloskey fence weaving machine and are organizing a company in Toledo which will handle the machine and also carry on a general contracting business for the construction of wire fences. For the past year H. H. Hunter has represented the McCloskey Wire Fence Company of Detroit. The territory secured by the new company comprises Ohio, Western Michigan, Indiana, Missouri, Kentucky, North Dakota, South Dakota, Wyoming, Colorado and Nebraska.

The United States Chain Company, Greenfield, Ind., have been incorporated with a capital stock of \$30,000 and will manufacture a variety of chains, together with drop forgings and sadlery hardware. The directors of the company are James A. Wells, Oakley Wells, William M. Wells, Samuel R. Wells, and William J. S. Woodall.

The Sterling Wrench & Tool Company have arranged for the erection of a factory at Dixon, Ill. The people of Dixon have subscribed liberally to the stock of the company. The managers of the company are residents of Rockford, Ill.

The Kilborn & Bishop Company of New Haven, Conn., manufacturers of drop forgings and forged hardware, have purchased the real estate adjoining their property formerly owned and occupied by the Lavigne Automatic Mfg. Company, to give them needed room for their rapidly increasing business. They are installing a new and larger engine to supply power for their two factories.

Miscellaneous.

The property of the Hocking Valley Coal Company of Columbus, Ohio, whose mines are located at Nelsonville, in the Hocking Valley, have been transferred to the Continental Coal Company, the new combine who were recently incorporated with a capital stock of \$3,500,000. The Continental plan to absorb the large coal companies along the lines of the Hocking Valley and Toledo and Central roads, and to compete with the Pittsburgh Coal Company and the Morgan Interests for the lake trade. They have purchased five companies, including the Hocking Valley, whose property comprised 1100 acres of fine coal land.

George J. Stier, 265 Elizabeth street, New York City, wagon manufacturer, has filed plans for a new plant, 23 x 75 feet, five stories. No contracts have been awarded yet.

The Deady Furnace Company, Houston, Tex., recently incorporated, have purchased the plant of J. S. Deady and will continue the manufacture of covered clay furnaces. J. C. Bering is president.

Michael B. MacDonald of Noank, Conn., has bought Hill's shipyard at Mystic and will begin at once the construction of three schooners, for which he has contracts. The yard has been idle for 20 years.

The Iron and Metal Trades.

The buying of Pig Iron is restricted to urgent requirements, since the greater number of the foundries have now covered their requirements far into the future. In some cases apparently the profit obtainable by reselling is too tempting and odd lots are coming into the market in that way. We have heard of instances, too, of requests for delaying deliveries, but these are all isolated cases to which too much significance should not be attached. In both Foundry and Bessemer Iron prices are from \$2 to \$3 above the "official" figures, which have ceased to be any basis of current transactions.

The attempt to feel the foreign market by inquiries for a round lot of Bessemer Pig has developed the fact that no Iron can be laid down in this country, duty paid, at prices anywhere near the market, and the effort to seek relief in that direction has been abandoned.

A little is being done in importing foreign Billets and we hear of some offerings of small lots, but the quantities involved are unimportant.

The Steel Rail situation is well reflected by the fact that recently a 10,000-ton order was placed in Germany for a trolley road in this State, the Rails fetching \$33 ex-ship, as against \$28 at mill, the "official" quotation. As a matter of fact Rails fit to relay have been sold by railroads at \$28, which is what the new Rails which they are putting down cost them at mill.

An interesting movement has been the selling of considerable blocks of Old Steel Rails for rerolling. Lately trunk lines and coal roads have disposed of 10,000 tons in the aggregate to go to a Western mill. There have been large offerings of Old Steel Rails from Europe, at least 20,000 tons being available at \$20 and \$21, but the sections are awkward, and so far as we can learn nothing has been done. The same is true of round lots of Old Iron Rails, of which some are under suspicion as to quality.

In the heavier lines of Finished Iron and Steel the reports continue very favorable. The tonnage of Structural work which is being closed is very large. Thus this week seven new buildings in Philadelphia, Pittsburgh, New York and Brooklyn call for 12,000 tons of material, and some large additional contracts are in sight. The Plate mills, too, are being pushed. Orders are being placed in some instances for 1903 delivery.

In the Pipe trade an interesting contract involves 11,000 tons of Pipe for an oil line, which is to be followed by 3000 tons more.

The pressure for deliveries on Bars, Sheets, Wire and other lighter lines continues, although it is whispered that in some directions specifications are not coming forward just as fast as was expected.

A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

	Apr. 16, 1902.	Apr. 9, 1902.	Mar. 19, 1902.	Apr. 17, 1901.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	\$19.75	\$19.75	\$18.50	\$15.25
Foundry Pig No. 2, Southern, Cincinnati	17.25	16.25	15.00	13.75
Foundry Pig No. 2, Local, Chicago	18.50	18.50	18.00	15.00
Bessemer Pig, Pittsburgh	19.25	18.25	17.50	16.25
Gray Forge, Pittsburgh	18.75	18.25	18.00	14.25
Lake Superior Charcoal, Chicago	21.50	21.50	20.50	17.50
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh	31.00	33.00	32.00	22.00
Steel Billets, Philadelphia	32.50	33.00	32.00	23.00
Steel Billets, Chicago .....	.....	.....	.....	.....
Wire Rods, Pittsburgh	36.50	36.00	36.00	35.00
Steel Rails, Heavy, Eastern Mill, nominal	28.00	28.00	28.00	26.00
Spikes, Tidewater	2.00	2.00	2.00	1.50
Splice Bars, Tidewater	1.60	1.60	1.60	1.30
OLD MATERIAL:				
O. Steel Rails, Chicago	17.50	17.50	17.00	13.00
O. Steel Rails, Philadelphia	22.00	.....	.....	16.00
O. Iron Rails, Chicago	24.00	24.00	24.00	18.50
O. Iron Rails, Philadelphia	25.00	25.00	24.00	18.00
O. Car Wheels, Chicago	19.00	19.00	18.00	16.50
O. Car Wheels, Philadelphia	17.75	17.75	17.50	16.50
Heavy Steel Scrap, Chicago	16.50	16.50	16.50	12.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.92	1.92	1.82	1.40
Common Iron Bars, Chicago	1.90	1.85	1.85	1.55
Common Iron Bars, Pittsburgh	1.80	1.80	.....	1.40
Steel Bars, Tidewater	1.80	1.80	1.75	1.50
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.40
Tank Plates, Tidewater	1.85	1.78	1.78	1.63
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.50
Beams, Tidewater	1.95	1.85	1.85	1.63
Beams, Pittsburgh	1.70	1.70	1.70	1.50
Angles, Tidewater	1.85	1.75	1.75	1.53
Angles, Pittsburgh	1.60	1.60	1.60	1.40
Skelp, Grooved Iron, Pittsburgh	2.00	1.95	1.95	1.65
Skelp, Sheared Iron, Pittsburgh	2.10	2.00	2.00	1.70
Sheets, No. 27, Pittsburgh	3.00	3.00	3.00	3.05
Barb Wire, f.o.b. Pittsburgh	2.90	2.90	2.90	2.90
Wire Nails, f.o.b. Pittsburgh	2.05	2.05	2.05	2.30
Cut Nails, Mill	1.95	1.95	1.95	2.00
METALS:				
Copper, New York	12.12	12.00	12.12	17.00
Spelter, St. Louis	4.17½	4.22½	4.10	3.77½
Lead, New York	4.10	4.10	4.10	4.37½
Lead, St. Louis	4.00	4.02½	4.02½	4.22½
Tin, New York	28.00	27.50	26.62	26.00
Antimony, Hallett, New York	8.00	8.00	8.00	9.00
Nickel, New York	50.00	50.00	50.00	55.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	4.19	4.19	4.19	4.19

Chicago.

FISHER BUILDING, April 16, 1902.

Greater activity is observed among jobbing houses and others intermediate between manufacturers and consumers than among the manufacturers themselves. This is not due to the absence of a demand from heavy buyers, but to the fact that the mills are now so overloaded with work that it is extremely difficult to place orders for anything like early delivery. This is throwing a very great deal of business to merchants which would ordinarily be handled directly by the mills. The consequence is that some of the local jobbing houses in heavy products are now breaking records in both the number of orders and volume of business. One house reports a trade three times as large as at the corresponding time last year.

Pig Iron.—Current orders run from carloads to 500-ton lots. The aggregate forms a fair trade, but by no means as large as that prevailing last month. The leading consumers have pretty well covered their requirements for the last half of the year, but there are still some who are taking their chances of being able to purchase at better prices a few weeks or months hence. It is difficult to quote prices at present, as a wide range prevails between what are termed schedule prices and those realized on prompt shipments or even on such Iron as can be pur-

chased for future delivery. The schedule of the leading Southern companies has not been changed from \$12, Birmingham, for No. 2 Foundry, but contracts are being placed at \$3 higher by some of the outside companies. No. 1 Ohio Foundry Iron has been sold at equal to \$22.10, Chicago, for early shipment. Prices on local iron are also nominally unchanged, but sales at higher rates for early shipments are also reported. Our quotations can therefore be considered largely nominal. We quote as follows:

Lake Superior Charcoal.....	\$21.50 to \$22.25
Local Coke Foundry, No. 1.....	19.00 to 19.50
Local Coke Foundry, No. 2.....	18.50 to 19.00
Local Coke Foundry, No. 3.....	18.00 to 18.50
Local Scotch, No. 1.....	19.00 to 19.50
Ohio Strong Softeners, No. 1.....	20.10 to 20.35
Southern Silvery, according to Silcon.....	16.90 to 19.15
Southern Coke, No. 1.....	16.40 to 18.65
Southern Coke, No. 2.....	15.65 to 18.15
Southern Coke, No. 3.....	15.15 to 17.65
Southern Coke, No. 1 Soft.....	16.40 to 18.65
Southern Coke, No. 2 Soft.....	15.65 to 18.15
Foundry Forge.....	14.65 to 17.15
Southern Gray Forge.....	14.65 to 17.15
Southern Mottled.....	14.65 to 17.15
Southern Charcoal Softeners, according to Silcon.....	18.65 to 19.15
Tennessee Silcon Pig.....	19.15 to 20.15
Alabama and Georgia Car Wheel.....	22.65 to 23.15
Malleable Bessemer.....	19.00 to 19.50
Standard Bessemer.....	..... to 20.00
Jackson County and Kentucky Silvery, 8 per cent. Silcon.....	20.10 to 20.60

Bars.—Manufacturers of Bar Iron are agreeably surprised to find the demand better than had been expected. The change, however, from the very active trade of March is marked, and it is believed that a comparatively quiet condition will prevail for a few weeks until general consumers begin to renew contracts expiring the coming quarter. Bar Iron prices are held at 1.90c. to 1.95c., Chicago, for mill shipments, but consumers are influenced to some extent by the low price quoted on Steel. This low price is nominal, however, as Steel manufacturers are so full of work that they cannot promise such deliveries as consumers desire. It is therefore believed that ere long they will be satisfied to make the best of the situation and take what they can get. Mill shipments of Soft Steel Bars are quoted at 1.75c. to 1.90c.; Hoops, 2.15c. to 2.20c., base, and Angles, 2.25c. to 2.40c., base. Jobbers report a heavy trade, which still includes a great deal of business coming from buyers who are usually customers of the mills. Shipments from stock are being made over a wide area, extending not only an unusual distance west, but also east, through Ohio. Small lots are quoted at 2c. to 2.10c. for Bars, and 2.20c., base, for Hoops.

Structural Material.—The situation grows more hopeless from the standpoint of mill representatives, who would like to take more business to satisfy their customers but are strictly forbidden to do so. The demand on the local yards is growing heavier and stocks are small. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 1.75c. to 1.85c. Small lots of Beams and Channels from local yards are quoted at 2.50c. to 3.50c.; Angles, 2.50c. to 3.50c. rates; Tees, 2.55c. to 3.50c. rates.

Plates.—This branch of trade is getting in line with other Steel products. Mills are becoming more crowded and are postponing deliveries further into the future. The agreed price quoted by manufacturers prevails in the case of very few mills, most of them now asking advances of \$2 to \$4 per ton. Store trade is much larger as a result of this condition of the mills. Mill shipments are quoted as follows: Tank Plate, ¼-inch and heavier, 1.75c. to 1.80c., Chicago; Flange, 1.85c. to 1.95c.; Marine, 1.95c. to 2.05c. Jobbers are selling small lots from store at 2c. to 2.10c. for Tank, and 2.25c. for Flange, with the usual extras for heads, segments, lighter gauges, &c.

Sheets.—The demand is excellent, an increase in orders being particularly noticeable in Black Sheets. Heavy gauges are still hard to get, the mills being from six to ten weeks behind on deliveries, and prices of Nos. 10 to 16 are strong, with an upward tendency. Mill shipments of No. 27 Black Sheets are quoted at 3.15c. to 3.25c., Chicago. Galvanized Sheets are now quoted at net prices, mill shipments being held on the basis of

4.40c. to 4.50c., Chicago, and small lots from store at 4.70c. to 4.75c. for No. 27.

Cast Pipe.—Manufacturers are enjoying a continued brisk trade. Manufacturers quote Water Pipe as follows: 4-inch, \$30; 6-inch, \$29.50; 8-inch and larger, \$28.50, Chicago.

Merchant Pipe.—A fair movement is in progress, but not unusually large for the season. Casing has been advanced 5 per cent. This advance is encouraging to those who have covered their requirements for Merchant Pipe for the immediate future. Carload lots are quoted as follows, random lengths: Black, ½ to ½ inch, 56½ off; ¾ to 12 inches, 63½ off; Galvanized, ½ to ½ inch, 43½ off; ¾ to 12 inches, 50½ off.

Boiler Tubes.—Manufacturers' agents report a most satisfactory trade. The volume of business is not only heavy, but prices are rigidly maintained. We quote as follows:

	Steel.	Iron.
2¾ to 3 inches.....	57½	47½
1¾ to 2½ inches.....	50	40
1 to 1½ inches.....	35	30
6 inches and larger.....	52½	45

Merchant Steel.—Quite a number of implement contracts have again been placed. Most large consumers have now covered their season's requirements, but the general demand is excellent, and the volume of business promises to be maintained. The heavy business in this line is shown by the fact that a leading company shipping into this territory report the past month the largest March in their history, and one of the largest months they have ever had. Mill shipments are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.95c. to 2.10c.; Open Hearth Spring Steel, 2.45c. to 2.55c.; Toe Calk, 2.25c. to 2.40c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 50 off in carload lots. Ordinary grades of Crucible Tool Steel are quoted at 7c. for mill shipments; specials, 12c. upward.

Rails and Track Supplies.—Inquiries for Heavy Rails are quite numerous, especially from electric railroads. Some small orders have recently been booked for such deliveries as manufacturers may be able to make. The regular quotation on Heavy Sections continues at \$28, Chicago, and Light Sections at \$32 to \$37. Fastenings are quoted as follows, in carload lots: Splice Bars or Angle Bars, 2c.; Spikes, 2.30c. to 2.40c.; Track Bolts, with Hexagon Nuts, 3.10c. to 3.20c.; Square Nuts, 2.95c. to 3.05c.

Billets.—Small lots of Open Hearth Forging Billets have been sold at \$39 to \$40.

Old Material.—A much larger quantity of Old Material seems available and holders are displaying a stronger desire to sell. The high-water mark was evidently reached last month, and the tendency is toward lower prices. The cheaper grades of Scrap are an exception to this rule, as they are not so plentiful and holders are able to get a little more money for them. Cast Scrap is not so strong as in March. The demand is not so active and offerings are larger. The following are approximate quotations per gross ton:

Old Iron Rails.....	\$24.00 to \$25.00
Old Steel Rails, mixed lengths.....	17.50 to 18.00
Old Steel Rails, long lengths.....	24.00 to 24.50
Heavy Relaying Rails.....	29.00 to 30.00
Old Car Wheels.....	19.00 to 20.00
Heavy Melting Steel Scrap.....	16.50 to 17.00
Mixed Steel.....	13.50 to 14.00

The following quotations are per net ton:

Iron Fish Plates.....	\$21.00 to \$21.50
Iron Car Axles.....	24.00 to 24.50
Steel Car Axles.....	21.50 to 22.00
No. 1 Railroad Wrought.....	19.50 to 20.00
No. 2 Railroad Wrought.....	17.25 to 17.75
Shafting.....	18.50 to 19.00
No. 1 Dealers' Forge.....	16.00 to 16.50
No. 1 Busheling and Wrought Pipe.....	13.50 to 14.00
Iron Axle Turnings.....	13.00 to 13.50
Soft Steel Axle Turnings.....	12.50 to 13.00
Machine Shop Turnings.....	12.50 to 13.00
Cast Borings.....	8.50 to 9.00
Mixed Borings, &c.....	8.00 to 8.50
No. 1 Bolders, cut.....	13.00 to 13.50
Heavy Cast Scrap.....	14.00 to 14.50
Stove Plate and Light Cast Scrap.....	11.00 to 11.50
Railroad Malleable.....	16.00 to 16.50
Agricultural Malleable.....	14.00 to 14.50

Metals.—Copper is quiet, but prices are unchanged at 13c. for carload lots of Lake and 12¾c. for Casting brands. Pig Lead is moving moderately at 4.05c. for

Desilverized, and 4.15c. for Corroding, in 5-ton lots. Selling prices on small lots of Old Metals are as follows: Heavy Cut Copper, 11½c.; Red Brass, 11¼c.; Copper Bottoms, 10½c.; Pipe Lead, 3.90c.; Zinc, 3.20c.

Coke.—The situation is a little easier, as shipments are now coming more plentifully from both Connellsville and West Virginia. Some uneasiness is caused by the possibility of a strike May 1 in the Pocahontas and New River districts, West Virginia. Spot Coke is selling at \$5.50, and contracts are quoted at \$5.25 for Standard 72-Hour Connellsville Foundry Coke.

The Ohio Iron & Metal Company have been incorporated at Chicago, with a capital stock of \$50,000. The incorporators are Moses Dreyfus, Samuel Deutsch and Albert S. Lour. This is the incorporation of an established business in Old Material, which has been conducted by the same parties in the Stock Exchange Building, Chicago, for several years.

Philadelphia.

FORREST BUILDING, April 15, 1902.

There is not much change to report at this time. The Pig Iron market has a steadier appearance, although spot deliveries are at a considerable premium, shading off according to date at the rate of about 25c. per week from May to December. Exact quotations are hard to give unless accompanied by explanations, which even then might be misleading. Practically, however, there has been very little change from last week, and it begins to look as though the high figures have been reached—temporarily any way. There is nothing to indicate weakness, however, and the trade will be very well satisfied if they can get Pig Iron during the next six months at from \$19 to \$20 for No. 2 X Foundry. Finished Material is in extraordinarily good demand, all departments being actively employed, and in most lines they have really more business than they can take care of. The talk is that further advances in some lines are probable, but as a matter of fact manufacturers appear to be independent of quotations, and name whatever figures they regard as fair and equitable. This is particularly the case with Structural Material for which \$10 and even \$15 per ton premium is charged for prompt shipments. Plates are strong also, and while about 1.92c. is quoted for Ordinary ¼-inch Plates, specifications are pretty carefully scanned before the orders are accepted. On the whole, therefore, the events of the week have been of an encouraging character, the demand steady and strong, prices firm but somewhat more settled, which will doubtless prove to be the best thing possible to promote uniformity and permanency.

Pig Iron.—The volume of business has diminished considerably during the past few days. Large consumers appear to have made arrangements which will carry them well into July, and are therefore under no necessity to add to their lines for a good while to come. Some indeed have covered for six months, some to the end of the year, so that the immediate demand is from small buyers or from those who have been disappointed in deliveries, and are compelled to buy something to tide over an emergency. There is a good deal of business of this kind, but, of course, it is liable to die out at any moment, so that it is not safe to figure on continued buying at fancy prices. There is no reason to expect any distinct weakness, however, as the exhaustion of stocks is so great that it will require months before normal conditions can be reached, and in the meanwhile the car shortage and other difficulties leaves the market peculiarly open to sudden jumps. Nothing can be said with absolute confidence, however, except that the immediate conditions are a little less stringent, and if deliveries are sufficient to keep things moving consumers may pull through without having to move prices much above to-day's level. But a good deal will depend on the supply of cars and fuel. If these can be furnished as required, the extreme scarcity of Pig Iron would be greatly ameliorated. Meanwhile sales have been within the limits named herewith; occasional lots due to spe-

cial emergencies, at as high as \$21 for No. 2 X, but ordinarily about \$1 less would be a fair average. To-day's prices would be about as follows for Philadelphia and nearby points:

	Deliveries to July.	July to December.
No. 1 X Foundry.....	\$20.50 to \$21.50	\$20.00 to \$21.00
No. 2 X Foundry.....	19.75 to 20.50	18.50 to 19.00
No. 2, Plain.....	18.75 to 19.00	17.50 to 18.00
Standard Gray Forge.....	18.25 to 18.50	17.50 to 18.00
Ordinary Gray Forge.....	17.50 to 17.75	16.75 to 17.50
Basic (Chilled).....	19.00 to 19.50	18.00 to 18.50

Billets.—The scarcity of Steel shows no abatement, consequently there are no open quotations. Prices might be anywhere from \$32.50 to \$34, but sellers have to be sought for and price arranged according to the dates for delivery.

Muck Bars.—Everything appears to be sold up, but nominal prices are from \$32 to \$32.50, f.o.b. cars seller's mills.

Plates.—The demand keeps up to the full limit, and orders for delivery before mid-summer are very hard to place. The productive capacity is large, but from present appearances there will be enough business to keep the mills fully employed during the balance of the year. Prices are strong (and may be advanced if raw material keeps at the figures now ruling), but for Philadelphia and nearby points are about as follows: Universals, 1.95c. to 2c.; Sheared, 1.95c. to 2c.; Flange, 2c. to 2.10c.; Fire Box, 2.15c. to 2.20c.; Marine, 2.25c. to 2.30c.

Structural Material.—There is no change in this branch of business, mills overcrowded with work and no prospect of catching up for an indefinite period. A great many inquiries are being sent out to foreign houses, but it is not known that any great amount of material has been secured so far, although it is urgently needed. Small Angles sell anywhere from 2.40c. to 2.60c., although nominal prices are as follows, but nothing can be had for reasonably prompt deliveries unless at a considerable premium. Angles, 1.75c. to 1.85c.; Beams and Channels, 15-inch and upward, 1.75c. to 1.85c.

Bars.—There is plenty of business and full employment appears to be the rule at most of the mills. Inquiries are numerous and prospects for the continuance of favorable conditions are excellent. Prices unchanged but very firm as follows: 1.92c. to 1.95c. for Iron Bars, and 1.80c. to 1.85c. for Steel Bars.

Sheets.—No change from last week. Demand active and prices firm as last quoted for carload lots and upward of best Sheets (and a tenth less for common qualities), viz.: No. 10, 2.20c. to 2.30c.; No. 14, 2.50c.; Nos. 16 and 17, 2.90c.; Nos. 18-21, 3c.; Nos. 26, 27, 3.20c.; No. 28, 3.30c.

Old Material.—Prices are a little steadier, and the weakness which appeared to be pending a few days ago has passed away. There is a good deal of stuff said to be coming in from Cuba and South American ports, but it is mostly sold to arrive. Bids and offers are about as follows for deliveries in buyers' yards: Low Phosphorus Scrap, \$25 to \$26; Choice Railroad Scrap, \$24.50 to \$25.50; Light, Ordinary, \$14 to \$15; Light Forge, \$16.50 to \$17.50; Machinery Cast, \$17.50 to \$18; Heavy Melting Steel, \$21 to \$21.50; Iron Rails, old, \$25 to \$26; Wrought Turnings, \$16.50 to \$17; Choice Heavy, \$18; Cast Borings, \$10 to \$10.50; Old Car Wheels, \$17.75 to \$18; Iron Axles, \$26 to \$27; Steel, \$24 to \$25.

H. M. Shimer & Co., Brass Founders and Smelters, have removed to their new works, at the northeast corner of Nineteenth and Washington avenue. The works will have a capacity of 20,000 pounds of Ingots per day.

Pittsburgh parties, including Joshua Rhodes and E. N. Ohl, have secured an option on the Rich Patch ore property in Virginia, controlled by W. W. Gibbs, the well-known promoter of Pittsburgh. It is understood that the property will be operated by the lessees, who are credited with the plan, if the developments warrant it, of building blast furnaces and a steel plant later on.

Last week the low record price of silver was reached with 53½ cents at New York and 24¼ pence in London.

Cincinnati.

FIFTH AND MAIN STS., April 16, 1902.—(By Telegraph.)

So far as the outward happenings in the Pig Iron market are concerned the situation remains in *statu quo*. There is a feeling, however, that the present remarkable condition of affairs is riding to a fall, and that the time before the opening of the next chapter will not be so very long. There is but comparatively little Iron selling, but it must be added that this is not altogether the fault of the buyers, who, whatever their needs may be, certainly want a whole lot more than the selling agencies here have to offer. The spot market, which was supposed to be absolutely barren some weeks ago, still ekes out a meager existence on odd lots and unexpected offerings which come from here and there with all sorts of explanations as to the why and wherefore of the offering. One recently reported sale is of a lot of 1200 tons of No. 2 Southern Iron for immediate delivery on the basis of \$15.25, Birmingham. The agency which quote this sale report no difference in their prices for spot and last quarter deliveries, and while it is rather a hard matter yet to determine what the actual value of Iron is, yet there is a feeling that, barring the combination prices, a range from \$14.50 to \$15.25 for No. 2, Birmingham, would be a fair representation of the actual market. Of course, nobody takes any seeming notice of the combination figures, which remain unchanged, and about the size of a man's hand in the distance are regarded with curiosity and some apprehension as to whether they mean wind or rain. While the situation is undoubtedly an extremely strong one and there is a unanimity of opinion as to the fact that there will be no surplus of Iron at the close of the year, yet it is undoubtedly true that there is a good tonnage yet to be disposed of, and a large portion of this is understood to be held by the combination furnaces. The word is out that another meeting of the combined furnaces is set for a nearby date. There will unquestionably be a strong effort made to put the prices up. The present selling prices are \$2.50 to \$3 higher than the combination quotations, and if the combined furnaces were to raise the market \$1 or even \$2, and throw their Iron in sight, it would make some of the prophets who have been industriously working on the bull side of affairs feel rather queer, and if the unexpected should happen and the furnaces were to stand pat on the \$12 basis and offer Iron, it would make the buyers who are rushing in on the present high basis feel as though they had landed somewhere in the unexpected. Just now it's anybody's guess as to what will happen, but it is well to note there is an undertone decidedly conservative in the situation, and a strong feeling that prices are at least about as high as they will be put. In this connection it is known there are some lots of semi-speculative Iron—that is, surplus amounts bought by consumers—which are almost on the point of being resold to make the handsome profit already accrued available. The gap between the minimum and maximum figures appears to be lessening, and is now down to about 50c., and that difference represents in the main the general feeling between nearby and last quarter offers. Freight rate from Hanging Rock district is \$1.10, and from Birmingham \$2.75. We quote, f.o.b. Birmingham, combination prices:

Southern Coke, No. 1.....	\$12.50
Southern Coke, No. 2.....	12.00
Southern Coke, No. 3.....	11.50
Southern Coke, No. 4.....	11.00
Southern Coke, Gray Forge.....	11.00
Southern Coke, Mottled.....	11.00
Southern Coke, No. 1 Soft.....	12.50
Southern Coke, No. 2 Soft.....	12.00

Other and more general quotations, f.o.b. Cincinnati:

Southern Coke, No. 1.....	\$18.00 to \$18.50
Southern Coke, No. 2.....	17.50 to 18.00
Southern Coke, No. 3.....	17.00 to 17.50
Southern Coke, No. 4.....	16.50 to 17.00
Southern Coke, No. 1 Soft.....	18.00 to 18.50
Southern Coke, No. 2 Soft.....	17.50 to 18.00
Southern Coke, Gray Forge.....	16.50 to 17.00
Southern Coke, Mottled.....	16.50 to 17.00
Ohio Silvery, No. 1.....	20.60 to 21.10
Ohio Silvery, No. 2.....	20.10 to 20.60
Lake Superior Coke, No. 1.....	20.35 to 20.85
Lake Superior Coke, No. 2.....	19.85 to 20.35
Lake Superior Coke, No. 3.....	19.35 to 19.85

Car Wheel and Malleable Irons.

Standard Southern Car Wheel, chilling grades.....	\$21.75 to \$22.75
Standard Southern Car Wheel, No. 2.....	21.25 to 22.25
Lake Superior Car Wheel and Malleable.....	21.25 to 22.50

Plates and Bars.—The market has been strong and active, and prices especially for small lots are stronger. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.90c. to 2c., with half extras; same in small lots, 2c. to 2.20c., with full extras; Steel Bars, in carload lots, and small lots, same as Iron Bars; Angles, in carload lots, 2.35c. to 2.50c.; Plates, ¼-inch and heavier, 2.05c.; 3-16 inch, 2.15c.; Sheets, No. 15, 2.85c. to 2.95c.

Old Material.—There has been quite a lull in trade, and while prices are not quotably lower, yet they are rather weak on an unchanged basis. We quote dealers' buying prices, f.o.b. Cincinnati, as follows, all prices, except No. 1 Wrought, on the basis of gross tons: No. 1 Wrought, \$18.50 to \$19; Iron Axles, \$24 to \$24.25; Steel Rails, rolling mill lengths, \$24 to \$24.25; same, short lengths, \$17 to \$17.50; Car Wheels, \$19 to \$19.50; Cast Machine Scrap, \$14.

St. Louis.

CHEMICAL BUILDING, April 16, 1902.—(By Telegraph.)

Pig Iron.—No new features have come up the past week in the Pig Iron situation in the market, and the sales and the inquiry are said to be running on a lighter scale. Quick Iron brings all sorts of high figures, and it is difficult to catch the top of the market in the movement of prices. We have heard of the recent sales of No. 1 Foundry ranging from \$18.50 to \$19, and figures proportionately as high in the other grades, but a glance over the volume of sales at these figures shows requirements to be of light order. There is no gainsaying the fact that Iron is very scarce right now and will continue so for a while, as the furnaces, with but few exceptions, are sold to July and are not authorizing at this time heavy bookings beyond that month. There is great room for improvement in the transportation arrangements and serious and general complaint goes the rounds of the trade. We quote for cash, f.o.b. St. Louis, as follows:

Southern, No. 1 Foundry.....	\$16.00 to \$19.00
Southern, No. 2 Foundry.....	15.25 to 18.25
Southern, No. 3 Foundry.....	14.75 to 17.75
Southern, No. 4 Foundry.....	14.25 to 17.25
No. 1 Soft.....	15.75 to 18.75
No. 2 Soft.....	15.25 to 18.75
Gray Forge.....	14.25 to 17.25

Bars.—The mills are said to be sold well ahead, and it is practically impossible to book new business except for far off delivery. The jobbing trade say demand and inquiry are good, and we note a revision in their prices for Iron as well as Steel Bars. We quote from mills: Iron Bars at 1.90c.; Steel Bars at 1.90c. to 2c. Jobbers quote Iron Bars at 2.25c. and Steel Bars at 2.25c., full extras.

Rails and Track Supplies.—A very heavy order of business continues as the report of the department, and the mills are said to be all sold well ahead. We quote Splice Bars at 2.10c. to 2.15c.; Bolts, Square Nuts, 3c. to 3.10c.; with Hexagon Nuts, 3.25c. to 3.30c.; Spikes, 2.35c. to 2.45c.

Sheets.—The demand for Sheets of all grades is said to be of such proportions that difficulty is being experienced in handling it promptly, as the mills are backward in their deliveries. Jobbers quote Stove Pipe size, No. 27, at 3.60c. to 3.65c., and Galvanized, under the new ruling, at net prices.

Angles and Channels.—The jobbers report a good volume of demand for Small Angles and Channels. A change in the price is to be noted for material of this class, and 2.50c. is now the quotation.

Pig Lead.—The demand and inquiry in the market for Pig Lead is fair, and prices show little change since our last report. We quote Chemical at 4c. and Desilverized at 4.05c.

Spelter.—The demand in the market for Spelter has quieted down considerably and prices have receded somewhat, and 4.17½c. to 4.20c. covers the price movement at this time.

The copartnership of De Camp Bros. & Yule was incorporated recently under the name of De Camp Bros. & Yule Iron, Coal & Coke Company, with a capitalization of \$300,000, fully paid up, with the following officers:

A. P. De Camp, president; William Yule, vice-president and treasurer; F. B. De Camp, secretary; A. Yule, assistant secretary. It is the purpose of the new corporation to carry on the same business as the old copartnership—viz., Pig Iron, Coal and Coke.

Cleveland

CLEVELAND, OHIO, April 15, 1902.

Iron Ore.—The Ore freight situation seems to have been permanently cleared up for this year, especially as it pertains to the contract rates. Some little Ore remains to be covered by contract, but on this there is hardly a controversy, many boats having recently been offered at the 75c. rate. While this is true pertaining to the head of the lakes business nothing has been done whatever from Escanaba, and at present it looks as if much of that Ore will be brought down wild. However, the wild rates to that point have been established on first cargoes at the rate offered by the shippers—namely, 55c. to Ohio ports. When the wild rate from Lake Michigan was established the list of contract rates from other ports was also made to apply upon the movement of first cargoes. The movement has been quite brisk for so early in the season, the first cargoes having been received at Ohio ports during the week. It is evident, however, that the shippers are not gaining the advantage by the April navigation of the lakes, which they thought for, and the amount of Ore that will be clipped from the season's total tonnage by this month's movements will be far short of expectations. The Steel Corporation, for instance, hoped to make two round trips with its boats and carry 1,000,000 tons. The difficulties the boats have experienced in early navigation, the freezing up of the stock piles up above, the prevalence of the strike among the tugmen on the south shore of Lake Erie and a few other causes have retarded the movement very greatly. Some few sales are being made, but the amount contracted for the year is not up to expectations. The prices remain unchanged at \$4.25 for Bessemer Old Range; \$3.25 for non-Bessemer Old Range and Bessemer Mesaba, and \$2.75 for non-Bessemer Mesaba.

Pig Iron.—The Coke supply in the Valleys has so far improved that the production of Pig Iron in this district is now about up to the maximum possibilities of the various stacks. With the maximum amount of Iron being produced the market conditions are not relieved. There is a little Foundry Iron for sale during the second half of the year, but it is not a big factor, and can supply no large demand. All quotations are purely nominal, the supply being so short; yet it is apparent that any one having material for quick shipment would be able to dispose of it at \$21 in the Valleys. Contracts for future delivery, were it possible to make them now covering any large quantities, might be made at a greatly reduced figure amounting to about \$2 a ton reduction. No sales have been made so far covering deliveries into 1903, but the material is pretty well sold up to the end of December this year. One of the Basic furnaces in this vicinity has sold its entire output to May 1 next year. The sale was made at the market price of the present time. Other furnaces in this vicinity are making the announcement that they are entirely sold up for the remainder of this year, and are about off of the market. This makes it possible for those having Basic Iron for quick shipment to command their own prices. The Bessemer trade is comparatively dull, as about all of the Iron has been sold up until the end of the first quarter of 1903 at \$16.50 in the Valleys.

Finished Material.—The market is in that peculiar predicament where the mills have about withdrawn from it for the remainder of the year, except so far as Sheets, Hoops, Bands and Bars are concerned. The shortage of Structural Steel is now being felt sorely. One company who are about to open a new plant that will use Structural Steel came upon the market this week with an inquiry for 7000 tons. The big mills had to refuse to furnish it. Some shipbuilding contracts have been hanging fire pending the purchase of the Steel, of which the ships are to be made. It was found that the larger sized shapes might be obtained during

the third quarter, but the smaller ones are off of the market. While the material is scarce the price holds steady at 1.70c., with store sales ranging between 2¼c. and 3c. The Bar situation is unchanged. The mills seem to be testing the market on the price of Bar Iron and are wavering between 1.70c. and 1.80c., with most of them asking 1.80c. for immediate delivery. The price of Steel Bars, however, holds firm on the 1.60c. basis, at Pittsburgh, and the demand is brisk. Bars up to 2 inches are being offered for delivery inside of five or six weeks, but larger sizes are impossible to obtain inside of four or five months. Bessemer Steel Bars are quoted at 1.60c., Pittsburgh and Open Hearth Steel Bars at 1.70c., Pittsburgh. The Plate situation is about the same as Structural Steel. All of the mills report being sold up to the end of the year and the inability to obtain Sheared Plate is one thing that is holding back some of the ship contracts which are pending. The price holds firm at 1.70c. In Sheets the demand seems to keep up good and strong and the sales have been so heavy that the first difficulties are being experienced in making deliveries as promptly as the consumers might desire. The Sheet trade is, however, in much better condition, from the standpoint of the consumer, than most of the other lines of Finished Steel. The quotations do not change in the least from what they have been heretofore, with most of the sales in this district being out of stock. The mills' quotations are based on No. 27 at from 3.10c. to 3.20c., and the store sales are based on a quotation of No. 27 at from 3.35c. to 3.50c. The demand for Pipe is better than it has been with the sales. The quotations are still 60 and 67 off list on Black Pipe and 48 and 55 off list, Pittsburgh basing discounts on Galvanized Pipe. The demand for Sheet Bars and Billets is still as brisk as ever with no change in the supply, the so-called independent mills being compelled to depend upon a foreign market for their supply. No quotations are made in this territory.

Old Material.—The Scrap market is moving along easily with moderate sales and with no change in the prices. Some of the middlemen, who sold short expecting a change in the prices, are having some difficulty still in obtaining material, but the prices to them are moderating some. The quotations do not change from: No. 1 Wrought, \$18 net; Cast Borings, \$8 gross; Wrought Turnings, \$13.75 gross; Cast Scrap, \$14 net; Old Iron Rails, \$22 gross; Old Iron Axles, \$22 net; Steel Rails, \$17 gross; Old Car Wheels, \$17 gross.

Pittsburgh.

(By Telegraph.)

PARK BUILDING, April 16, 1902.

Pig Iron.—No large lots of Pig Iron are being sold, mainly for the reason that the Iron cannot be had. Some of the large Steel companies that are very short of metal would no doubt be willing to pay top prices to get it, but the furnaces seem to be sold up. Prices on Pig Iron are steadily advancing, and Bessemer for delivery prior to July has sold at \$19, Valley furnace. It is probable that \$18.50 could be done for shipment over last six months if the Iron could be had, but this price seems to be the bottom of the market. There is a heavy demand for Forge Iron, and it is about as high in price as Bessemer, having sold for prompt delivery at \$19.25, Pittsburgh. For shipment over last six months of the year \$18.50 to \$18.75, Pittsburgh, might be done. Heavy premiums are being paid for Foundry Iron, and the founders are being held responsible for the advance in prices in Pig Iron, as it is said they are buying in excess of their actual requirements. We quote Bessemer Iron at \$18.50 to \$19, at Valley furnace, prices depending on deliveries wanted. Gray Forge is \$18.75 to \$19.25, Pittsburgh. No. 2 Foundry for reasonable prompt delivery is about \$21, Pittsburgh. We note a sale of about 500 tons of Gray Forge for spot shipment at \$19.25, Pittsburgh; 3000 tons of Bessemer for last six months at \$18.50, Valley furnace, and 1000 tons of Gray Forge for last six months at \$18.50, Pittsburgh.

Billets.—Only small lots of Steel are being sold and for prompt shipment it brings from \$31 to \$32, Pittsburgh. On contracts for forward delivery Steel could likely be bought at lower prices. Sheet Bars are \$33 to \$34 delivered.

Muck Bar.—Prices have again advanced and best grades of Muck Bar are held at \$33.25 to \$33.50, Pittsburgh. We note a sale of 500 tons at the lower price.

(By Mail.)

Stories are again current in the daily press of a \$200,000,000 combination in the Iron trade, having for its object the fighting of the "Steel Trust," which is supposed to refer to the United States Steel Corporation. The story goes that options have been secured on a number of blast furnace plants in the two valleys, such as Girard Iron Company, Cherry Valley Iron Company, Brier Hill Iron & Coal Company and others. Concerns also said to be included are Riter-Conley Mfg. Company of Pittsburgh, Youngstown Iron Sheet & Tube Company of Youngstown, Ashland Steel Company of Ashland, Ky., and about a dozen more. The name of Henry C. Frick has also been mentioned as being prominently identified with the new combine. It is hardly necessary to deny that any consolidation of above interests is to be made. It is a fact that some months ago options were asked on a number of furnace and mill plants in the Central West by a law firm known as Blymyer, Hobbs & Clarke of New York. In most cases options were refused. Officials of some of the companies mentioned above absolutely deny their intention of going into any combine. There are outside of the United States Steel Corporation many other concerns making Pig Iron, Steel and other material that have valuable plants and that are earning largely. The owners of these plants will no doubt prefer to keep their properties themselves, at least as long as the present prosperous condition in the Iron trade lasts. The scarcity of Pig Iron is getting worse and negotiations which were under way looking to the importation of a round tonnage of Bessemer Iron by one of the leading Steel companies have been abandoned, as it was found that the price of Iron laid down in the Pittsburgh district was so high that it precluded the possibility of using it. It is likely that Steel plants will be more or less crippled in their operations for some months on account of the scarcity of Iron. It is reported that some small lots of Bessemer for early delivery have sold at very close to \$19 at furnace. Some stray lots of Gray Forge for spot shipment have sold at \$19, Pittsburgh. Premiums are being paid right along for Foundry Iron, and some small lots of No. 2 have sold above \$21, Pittsburgh. One of the leading Steel companies claim that they could sell Billets as high as \$32 here if they had the Steel to spare. There is no special change in Finished Material. Demand is not as urgent as it was, but this is for the reason that large consumers have placed their contracts and only current business is being booked. Buying is likely to be rather quiet for the next three or four months, but this will give the mills a chance to catch up to some extent on contracts.

Muck Bar.—There is a good deal of inquiry and the best grades of Muck Bar are firm at \$32.50 to \$33, Pittsburgh. Several sales at the lower price are reported.

Plates.—The situation as regards tonnage is a good deal better and the leading Plate mills are pretty comfortably filled for the next two or three months. For prompt delivery 1.70c., Pittsburgh, is being obtained for Plates in some cases. Official prices are as follows: Tank Plate, $\frac{1}{4}$ inch thick and up to 100 inches in width, 1.60c. at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price to 3c. Plate more than 100 inches wide, 5c. extra per 100 lbs. Plate 3-16 inches in thickness, \$2 extra; gauges Nos. 7 and 8, \$3 extra; No. 9, \$5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms, net cash in 30 days. Small lots of Plates from store are sold on the basis of 1.70c. to 1.75c. for Tank, with the usual advances for the higher grades.

Ferromanganese.—Prices of Foreign Ferro are lower. English Ferro is being offered in this market at about \$49, while German Ferro, which usually runs high in phosphorus, has been offered close to \$47. Domestic is held at about \$52 for carload lots. Large contracts made some time ago for delivery over all of this year were at a lower price.

Steel Rails.—Some current orders for small lots are being placed right along. It is probable the mills will carry over a good deal of tonnage into 1903. We quote Standard Sections at \$28, at mill.

Spelter.—We quote best grades at 4.15c., Pittsburgh.

Bars.—The big contracts are pretty well placed, but a good deal of current business is being entered. The mills rolling Iron and Steel Bars are pretty well sold up for the next six months, and some of them have contract deliveries on which run into next year. We quote Steel Bars at 1.60c., half extras, for carloads and larger lots, while small lots bring as high as 1.75c. All specifications for less than 2000 lbs. of a size are subject to the following differential extras: Quantities less than 2000 lbs., but not less than 1000 lbs., 0.05c. per lb. extra; quantities less than 1000 lbs., but more than 500 lbs., 0.15c. per lb. extra; quantities 500 lbs. or less, 0.25c. per lb. extra; the total weight of a size to determine the extra, regardless of length. We quote Iron Bars at 1.80c., Pittsburgh, extras as per National Bar Iron Card.

Structural Material.—The mills are congested with tonnage, and some contracts have been placed for delivery as far ahead as July of next year. Many large buildings have been postponed until next year, which would have taken thousands of tons of Material. As high as $2\frac{1}{2}$ c. a lb. is being offered for Beams for prompt shipment. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inches, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.50c., half extras, at mill; Universal and Sheared Plates, 1.60c. All above prices are f.o.b. Pittsburgh. Actual prices on Beams and Channels are from 1.80c. to 2c., while small lots for prompt shipment bring 2.25c. and higher.

Sheets.—The Sheet business is in very satisfactory condition, demand being heavy and prices very profitable. Better deliveries can be obtained on the lighter gauges of Black Sheets than on the heavier gauges and on Galvanized. We quote: No. 27 Black Sheets, box annealed, one pass through cold rolls, at 3c., and No. 28 at 3.10c. in carload lots. Small lots of No. 27 from store are held at 3.10c. to 3.20c., and No. 28, 3.15c. to 3.25c. We quote Galvanized Sheets at 70, 10 and 5 off in carloads and 70 and 5 in small lots. All the above prices are f.o.b. maker's mill.

Rods.—The Rod market is very active, and we quote Bessemer at \$36 to \$37, and Basic at \$38 and higher, depending on deliveries wanted. Jones & Laughlins have discontinued the manufacture of Rods for a time at least, and are tearing out their Rod mill and putting in its place Merchant Bar mills. The product of these new mills is badly needed by the firm to give them a full assortment of sizes.

Hoops and Bands.—We quote Hoops at 2c. base in carloads, full extras, as per Hoop card. We quote Bands at 1.60c. for Bessemer stock, 12 gauge and heavier; open hearth stock is \$2 higher, all f.o.b. at mill.

Shafting.—The Cold Rolled and Cold Drawn Shafting Manufacturers' Association met in Pittsburgh last week, but made no change in prices. We quote Shafting at 50 per cent. off in carloads and 45 per cent. in less than carloads in Basing Territory.

Merchant Steel.—The heavy contracts placed last month have filled the mills up for months ahead and several of the leading mills are practically out of the market as sellers for balance of this year. Mills quote as follows: Tire Steel at 1.80c. to 2c.; Open Hearth Spring, 2.25c. to 2.50c.; Hammered Lay Steel, 3.75c. to 4c.; Cold Rolled and Cold Drawn Shafting, 50 per cent. off in carloads and 45 per cent. in less than carloads in Basing Territory; Tool Steel, $6\frac{1}{2}$ c. to 7c. for ordinary grades, 12c. and upward for special grades, all f.o.b. at mill.

Merchant Pipe.—The heavy contracts placed by leading consumers have filled the mills up for several months ahead, but current business continues large and the market is very firm. Pittsburgh basing discounts for carloads are as follow:

Merchant Pipe.	Black. Per cent.	Galvd. Per cent.
$\frac{1}{8}$ to $\frac{1}{2}$ inch, inclusive.....	60	48
$\frac{3}{4}$ to 12 inch, inclusive.....	67	55

Skelp.—Grooved and Sheared Iron Skelp is held at about 2c. to 2.10c. delivered. Some of the mills rolling Steel Skelp quote higher prices.

Boiler Tubes.—Demand is active and prices are firm. Discounts in small lots are as follows:

Boiler Tubes.	Up to 22 feet. Per cent.
Steel.	
1 to $1\frac{1}{2}$ inch, inclusive.....	47 $\frac{1}{2}$
$2\frac{3}{4}$ inch to 5 inch, inclusive.....	65 $\frac{1}{2}$
$1\frac{1}{4}$ inch to $2\frac{1}{2}$ inch and 6 inch to 13 inch, inclusive..	60
Iron.	
1 inch to $1\frac{1}{2}$ inch and $2\frac{1}{2}$ inch.....	43 $\frac{1}{2}$
$1\frac{3}{4}$ inch to $2\frac{1}{4}$ inch.....	43
$2\frac{3}{4}$ inch to 13 inch.....	53

The mills name lower prices to the jobbing trade.

Coke.—The *Courier* gives the output of Coke last week in the Connellsville region as 220,637 tons and shipments 11,092 cars. The furnaces in the Pittsburgh and Valley districts are getting Coke more promptly than for some time, but shipments to Western points are badly hampered for lack of cars and motive power. We quote strictly Connellsville Furnace Coke at \$2.25 a ton and 72-hour Foundry at \$2.75 to \$3 a ton on contracts. Main Line Coke, made outside of the Connellsville region, is sold at slightly lower prices.

The offices of the Colonial Steel Company have been removed from Bank of Commerce Building to a suite of rooms on the twelfth floor of the Keystone Building, Fourth avenue, Pittsburgh, Pa.

The Pittsburgh office of the Morgan Engineering Company has been removed from Carnegie Building to Room 1114 Frick Building, Pittsburgh.

Birmingham.

BIRMINGHAM, ALA., April 14, 1902.

Items of interest concerning the Iron market are not plentiful. All the changes that can be rung on the acute scarcity of spot Iron and the demand for it have been utilized to fill space, and there is very little that is new and of interest to say. If there is any change at all it is toward a gradual hardening of values for prompt Iron, which does not surprise thinking people. Prices will recede when buyers' demands ease up or when there are evidences of accumulation. There are no signs yet of the happening of either of these conditions. The demand for prompt Iron is still greater than can be supplied. But so little is the supply that a very moderate demand would materially exceed it. Some sellers say the demand is fine, but that is based on the fact that the larger producers having withdrawn from the general market, buyers are restricted as to the limited source of supply, and the orders are concentrated on those who can furnish some, even if it be in homœopathic doses. The larger interests, with one exception, the trade understands are practically out of the market for prompt Iron, and this explains the falling off of orders. Buyers have been finally convinced that they have no available prompt Iron to feed to them. The price was advanced the past week, but at the advance we are yet materially lower than Northern competitors, and this fact prompts constant efforts from buyers who will not down. There were sales of prompt No. 2 Foundry Iron at \$15, and some went at \$15.40. Some Gray Forge went at price that cannot be absolutely stated but circumstances point to \$14. Some No. 3 Foundry went at \$14.50, and some Silver Gray changed hands at \$14.50. One lot of No. 1 Foundry Iron sold at \$16, last half of 1902 delivery. The amount was 500 tons, and this amount was the largest lot reported. The other sales were of an insignificant nature. Under ordinary circumstances the quantity sold would indicate a slow market. As it is they simply accentuate ability to fill up only very small holes. The situation as to quotations on the basis of

\$12 for No. 2 Foundry remains unchanged, and from what your correspondent could learn new business is small, and, as a rule, it is confined to caring for regular trade. The demand has extended as to delivery into the first quarter of 1903, but to only a limited extent. The inducements to either side to venture that far are not very taking. The action, though of the Steel colossus in supplying anticipated wants that far ahead, is giving backbone to confidence. Shippers have been badly hampered as to deliveries by untoward circumstances, but all now have "their shoulders to the wheel" in an earnest effort to clean up old business. At the end of this month furnace yards will show less Iron in stock than has ever been heretofore reported. The shipments of Pig Iron for the month of March from Alabama and Tennessee were 147,224 tons. Of this amount 77,489 tons went from this district. The shipments of Steel were 8383 tons, all furnished by the Steel plant of the Tennessee Coal, Iron & Railroad Company. The shipments of Cast Iron Pipe from Alabama and Tennessee were 16,184 tons. The Birmingham district furnished 8194 tons of this amount. The exports were 180 tons, only, of Pig Iron. They simply remind one that "they used to be the racket but they don't go now." The shipments of Cast Iron Pipe were the heaviest for any one month on record. As for Steel the working of the mill has reached a point of efficiency very satisfactory to the management and increased efficiency has been accompanied with increased output. It is germane to state here that the Tennessee Company have added Ferro-Phosphorus to their list of furnace products having been successful in efforts to make it in quantity sufficient to justify them in entering the general market.

New York.

NEW YORK, April 16, 1902.

Pig Iron.—The market continues quiet, but exceedingly strong, and prices for prompt Iron are advancing. In fact, the market is stiffening for later deliveries. We quote for forward delivery, Northern Irons: No. 1, \$20.50 to \$21; No. 2 X, \$19.25 to \$19.75; No. 2 Plain, \$18.75 to \$19.50; Gray Forge, \$18.50 to \$18.75, at tidewater. Tennessee and Alabama brands are as follows: No. 1 Foundry, \$16.75, the official quotation for early delivery, \$19.50 to \$20.50; No. 2 Foundry, \$15.75, the official quotation for early delivery, \$18.75 to \$19.

Steel Rails.—The market is exceedingly firm, and as an indication of the situation we may note that a lot of 10,000 tons of 70-lb. Rails for a trolley line in this State were purchased recently from a German works at \$33, ex-ship. Relayers, which are very scarce, have sold at \$28, or the same price at which new Rails have been purchased at mill on this season's contracts. Light Rails have sold at high as \$42 to \$43 and continue very scarce.

Finished Iron and Steel.—The volume of business in Structural Material continues very heavy. During the past week contracts for seven buildings located in Pittsburgh, Philadelphia, New York and Brooklyn called for a total of 12,000 tons of material. A good deal of new work is coming up in this city. Recent railroad orders taken by the American Bridge Company include 1000 tons for the Wheeling & Lake Erie, 800 tons for the Denver & Rio Grande, and 3000 tons for the Burlington. Official quotations on Structural Material are entirely nominal so far as purchasers for prompt delivery are concerned, so that our lower figures apply only to contracts for distant delivery placed by regular customers of the mills, involving large quantities. We quote at tidewater: Beams, Channels and Zees, 1.75c. to 2.25c.; Angles, 1.75c. to 2.25c.; Tees, 1.80c. to 2.25c.; Bulb Angles and Deck Beams, 2c. to 2.25c.; Sheared Steel Plates are 1.78c. to 1.95c. for Tank, 1.90c. to 2c. for Flange, 2c. to 2.10c. for Fire Box. Refined Bars are 1.80c. to 1.85c.; Soft Steel Bars, 1.80c. to 1.85c.

H. M. Whitney has resigned the presidency of the Dominion Iron & Steel Company of Canada, but will continue a member of the board of directors of the corporation. It is understood that James Ross, at present vice-president and general manager of the company, will succeed Mr. Whitney as president.

Metal Market.

NEW YORK, April 16, 1902.

Pig Tin.—Operations of the speculative element in London have continued. The manipulators held the quotation as firmly as they did a week ago and sent prices higher. Yesterday this market again reached 28c. for spot. The market was very inactive, however, as consumers are holding out just as long as they possibly can. The shipments from the Straits were very small during the first half of this month. They amounted to but 1250 tons, as compared with 2210 tons for the same period last month. The London market netted an advance of £3 for the week. At the close to-day the market was quoted £128 5s. for spot and £125 15s. for futures. This market closed strong at 28c. to 28½c., which is from ½ to 1 point higher than last week.

Copper.—Yesterday marked the inauguration of trading under the Standard Copper contract at the New York Metal Exchange. The trade are showing an active interest in this movement, and a comparatively lively business was transacted. The official record shows sales of July Copper as follows: 50 tons, 11.20c.; 100 tons, 11.15c. It is said that quite a large business was done later at 11.10c. for the same delivery. Considering that the price of 11.15c. is equal to £51 5s., London, and that yesterday's London quotation for Standard Copper was £53 2s. 6d. for July delivery, the American price should have the effect of softening the market abroad if the New York market is accepted in London as the criterion. The opening London quotation this morning was somewhat lower and at the close the market came 7 shillings 6 pence lower than yesterday's close. The closing quotation for both spot and futures to-day was £52 17s. 6d. Best Selected has advanced 10 shillings since last week, coming to-day £56 15s. In Lake Copper there were small sales made during the week at 12½c. It is said, however, that the metal can still be bought at 12c., and that Electrolytic and Casting were obtainable at 11½c. and 11¼c., respectively. Exports are very large, amounting to about 7700 tons for the first half of this month.

Pig Lead.—Is dull, uninteresting and without change. The quotation of the Smelting & Refining Company remains fixed at 4.12½c. for Desilverized spot and 4.10c. 15 days, New York. London continues to advance, being £11 12s. 6d. at the close to-day.

Spelter.—The market is rather confused. A shortage of Ores a week ago resulted in two of the large concerns bidding against each other, and sending prices upward. This has stopped, and consumers have not as yet come in for their regular supply, consequently it is a waiting game to see whether a fresh demand keeps prices up or whether the consumers can wait to see prices recede. To-day the market is a little easier in tone. The quotations range from 4.40c. to 4.45c. for spot, New York. Shipments from the West are offered at 4.40c. St. Louis is quoted at 4.25c. and London at £17 15s., a trifle lower than last week.

Antimony.—Is unchanged. Hallett's is quoted 8c. to 8½c.; Cookson's, 10¼c., and outside brands, 7½c.

Nickel.—The situation is unchanged. Ton lots are quoted at 50c.

Quicksilver.—Prices are on a basis of \$48 per flask of 76½ lbs. in lots of 56 flasks or more.

Tin Plates.—The market is entirely unchanged. The American Tin Plate Company are quoting for delivery until October 1 on a basis of \$4.19 per box of standard 100-lb. Cokes, f.o.b. New York, or \$4 f.o.b. Pittsburgh district.

John Stanton reports the copper production in the United States and of the foreign reporting mines and United States exports as follows, in gross tons of 2240 lbs.:

	Reporting mines.	Outside sources.	Total product.	U.S. foreign mines.	U. S. exports.
First half 1895....	70,612	9,100	79,712	42,484	34,215
Second half 1895....	84,885	6,600	91,485	43,674	30,507
Total 1895.....	155,497	15,700	171,197	86,178	64,722
First half 1896....	94,180	7,200	101,380	42,255	58,216
Second half 1896....	95,314	7,200	102,514	43,941	67,287
Total 1896.....	199,494	14,400	203,894	86,196	125,503

First half 1897....	103,651	5,000	108,651	44,263	64,870
Second half 1897....	100,555	6,900	107,455	44,007	64,340
Total 1897.....	204,206	11,900	216,106	88,270	129,210
First half 1898....	112,687	7,800	120,487	40,880	68,284
Second half 1898....	103,535	10,250	113,785	43,674	76,831
Total 1898.....	216,222	18,050	234,272	84,554	145,115
First half 1899....	111,987	12,500	124,487	43,629	56,460
Second half 1899....	118,818	18,900	137,719	45,611	63,351
Total 1899.....	230,806	31,400	262,206	89,240	119,811
First half 1900....	114,177	20,400	134,577	43,153	90,747
Second half 1900....	113,810	20,400	134,104	46,278	63,335
Total 1900.....	227,987	40,800	268,681	89,431	160,082
First half 1901....	112,704	20,600	133,394	46,847	50,027
Second half 1901....	110,561	21,300	131,861	53,394	44,339
January, 1902....	15,155	3,800	18,955	7,367	15,021
February, 1902....	16,931	3,400	20,331	8,475	16,108
March, 1902.....	20,335	3,700	24,035	8,979	20,097

The Crane Consolidation.

Negotiations looking toward the consolidation of the builders of traveling cranes are approaching a close. It will be recalled that mention of this subject was made in the columns of *The Iron Age* several weeks ago. The new company are to be named the American Crane & Conveying Machine Company, but details of the project are still carefully guarded. We are informed, however, on good authority that the company are to include the Shaw Electric Crane Company, Muskegon, Mich.; the Whiting Foundry & Equipment Company, Harvey, Ill.; Pawling & Harnischfeger, Milwaukee, Wis.; the Morgan Engineering Company, Alliance, Ohio, and the crane departments of the Niles-Bement-Pond Company and William Sellers & Co., Incorporated. It is stated that options have been secured from the concerns controlling these interests at present. In a prospectus issued by the promoters some time ago these concerns, together with the Brown Hoisting Machinery Company were named. We are advised by the Brown Company that they have given no option on their plant. It is possible that the Industrial Works, Bay City, Mich.; Alfred Box & Co. of Philadelphia, the Northern Engineering Works of Detroit, Mich., and the Wellman-Seaver-Morgan Engineering Company, Cleveland, will be included in the new consolidation. There is a report which states that the new company will take up the manufacture of their own electrical motors and appliances, and probably arrange for the rolling of their own steel shapes. The concentration of plants is also spoken of. John C. Converse of the United States Steel Corporation has been identified with the promotion of this project for some months. Blair & Co. of New York are handling the financial arrangements, and Stayton & Campbell and Sullivan & Cromwell of New York are attending to the legal details.

The Bessemer Coke Company.—The Bessemer Coke Company, Lewis Block, Pittsburgh, are about to let contracts for the building of 100 more beehive coke ovens at their Griffin works in the Klondike field. In the Connellsville region this company will also soon put in service 200 individual cars. An agreement has been reached by which the Monongahela River Railroad, which is owned jointly by the Pennsylvania & Pittsburgh and Lake Erie railroads, will be extended into the Klondike field, the road to be completed by August next. It has been agreed that the Pittsburgh & Lake Erie will haul the coke from the Klondike field over this new road, and this will relieve to a great extent the congested condition which has existed in this field for a long time on account of the shortage of cars and motive power. Consumers of coke coming from the Klondike field will get better deliveries when this new road is finished.

No. 1 Ensley Furnace of the Tennessee Coal, Iron & Railroad Company, at Ensley, Ala., was blown in a few days since.

No. 1 Furnace of the Allentown Iron Works, at Allentown, Pa., which is under lease to the Empire Iron & Steel Company, will be blown in this week.

Oxford Furnace of the Empire Iron & Steel Company, at Oxford, N. J., has gone out of blast, the cross head of the blowing engine having broken. It will take some weeks to make repairs.

The New York Machinery Market.

NEW YORK, April 16, 1902.

A very important matter that has been in abeyance for a number of months is now being closed. It is the purchasing of the equipment for the new plant of the White Mountain Paper Company, who are to build at Portsmouth, N. H., the largest pulp and paper plant in this country. A list of the equipment to be purchased has been previously printed in *The Iron Age*. The company have offices at 85 Liberty street, in charge of John C. Morgan, who was the designer and general manager of the Niagara plant, which is now controlled by the International Paper Company. The order for the boilers has just been placed with the Babcock & Wilcox Company. The entire installation will aggregate 16,000 horse-power divided into various size batteries. Acme stokers will be applied to these boilers. None of the other apparatus has yet been ordered, although the data is practically complete and it is probable that the orders will be placed very shortly. The engine order will include 34 units ranging from 300 to 1800 horse-power and aggregating 16,000 horse-power. It was rumored in the street yesterday that an order for 27 engines had been awarded to a prominent builder, but this was denied by Mr. Morgan. The contracts will also be placed this week for 20 paper machines capable of turning out the widest newspaper. It is understood that this department of the plant will be completed just as soon as possible. The company own 650 square miles of forest land in Central New Hampshire and that part of the Saco River Valley which lies in Southwestern Maine.

Machine Tools, &c.

In the machine tool trade business during the week was confined entirely to small and medium sized transactions. Of these there were a large number, and the aggregate of sales for the week was good. Prices are firm and we hear of an advance of about 5 per cent. on a line of boiler makers' tools. No large lists came up and those that are now under consideration are still *in statu quo*. No purchases have yet been made on the list of tools for the Lackawanna Railroad and we hear that the various items have been referred to the respective shops. The bids received by the New York, New Haven & Hartford Railroad as a result of the list recently issued have not yet been tabulated. This does not pertain to the Readville, Mass., matter, which we understand is entirely settled, almost the entire equipment having been purchased from Manning, Maxwell & Moore.

The Coatesville Boiler Works of 141 Broadway, New York, and Coatesville, Pa., are equipping a new extension to their main shop. Some of the machinery has been purchased, and other lines are now being decided upon. A 15-ton Niles electric traveling crane has just been installed, and another 15-ton crane is to be purchased shortly. A Hall air compressor will be used in connection with the operation of pneumatic tools, some of which are still to be purchased. Two Hilles & Jones punches and shears have been purchased and also complete hydraulic riveting and flanging outfits from the Niles-Bement-Pond Company. Another punch of larger dimensions is soon to be secured. A Harrisburg engine direct connected to a General Electric generator has just been installed. The new shop is 425 feet long and 110 feet wide.

The Ruggles-Coles Engineering Company of 39 and 41 Cortlandt street have just obtained an order from the California Lime & Cement Company of Oakland, California, for two dryers to be used in connection with general extensions to their plant.

Henry E. Fanshawe, president of the Tyden Seal Company, 135 Broadway, New York, will soon be in the market for about \$60,000 of machinery for a new plant, which the company intend building in the vicinity of Buffalo. Their present plant is at Hastings, Mich., and a considerable quantity of new machinery has just been ordered for their plant. A change of location is soon to be made, however. The company manufacture a device for sealing the doors of railroad cars, which is used

exclusively by several railroad and express companies, as well as a number of industrial concerns. The company are capitalized at \$1,200,000. Mr. Fanshawe states that he would like to receive catalogues and prices relative to machine tools, presses &c. Also engines, boilers and power plant appliances.

C. J. Bradley, manager of the Independent Whip Company of Westfield, Mass., informs us that they are planning a new factory. It will be four stories, 205 by 43 feet, with isolated power plant. A new 75 horse-power engine and 125 horse-power boiler will be required for a lighting plant. Automatic sprinkler and electric fire alarm systems are also to be installed. A modern machinery equipment is also to be purchased.

The Soule Steam Feed Works, manufacturers of saw mill specialties, Meridian, Miss., are in the market to purchase an iron planer, radial drill, a shaper and a key seating machine, good second hand tools are preferred.

George E. Drew and Robert W. Onyons have organized the D. & O. Machine Company and equipped a plant at 416 Atlantic avenue, Boston, Mass. All classes of machine work will be performed, but special attention will be paid to experimental, model, repair and metal pattern work. The new plant is so arranged that privacy can be afforded to parties designing patented articles.

The new shops of the New York, New Haven & Hartford Railroad, at Readville, Mass., are nearly completed. The wood mill is 350 feet long by 125 feet wide. The S. A. Woods Machine Company, South Boston, Mass., are now building for this mill a large number of their car machines, some of them being special for their work.

The mill of the Chicago, Rock Island & Pacific Railroad, at Horton, Kan., which was destroyed by fire about two months ago, has been rebuilt by working on same night and day. The machinery was entirely destroyed, and the S. A. Woods Machine Company, South Boston, Mass., are equipping the shop with a full line of their machines.

Boilers, Engines, &c.

In the engine and boiler trade business is quite brisk. A number of good orders have been closed during the week, notably the White Mountain Paper Company matter quoted above, and inquiries have been very good.

Extensions of considerable importance are contemplated by the North Jersey Railway Company of Jersey City, N. J. E. F. C. Young is the president of the company, with offices at Jersey City. It is reported that the power station at Newark is to be doubled in size and will be placed on high tension service. The extensions, it is said, will cost upward of \$1,000,000. Mr. Young stated to a representative of *The Iron Age* that the improvements for the Newark line had been decided upon and plans were now being prepared for carrying them out. Contracts are soon to be placed for a 5000 horse-power addition, including boilers, engines and all accessories. Orders have just been placed with the John Stephenson Company of Elizabeth, N. J., for 60 cars.

A short time ago we referred to the extensions being made by the Johnston Harvester Company of Batavia, N. Y. They are now placing their orders for equipment. The Westinghouse Machine Company will install a 400 kw. Westinghouse-Parsons steam turbine direct connected to a Westinghouse generator. The Green Fuel Economizer Company of 74 Cortlandt street and Matteawan, N. Y., will furnish fuel economizers for the entire plant.

The General Electric Company have just placed an order for 3000 horse-power of Sterling water tube boilers.

Hoooven, Owens & Rentschler of 39 Cortlandt street have just closed an order for a 500 horse-power cross compound direct connected engine for the Mohawk Mills of Amsterdam, N. Y. The boilers have not been ordered as yet. Other orders taken by the former concern during the last week included 500 horse-power tandem compound engine for the Atlantic Rice Mills of Beaumont, Texas, and a 200 horse-power simple engine for the Electric Wire Works of Rome, N. Y.

The Green Fuel Economizer Company were awarded the order for the economizers in connection with the

power plant of the Rome Brass & Copper Company. They also received an order from the Kelso Laundry Company of Rochester, N. Y., for a plant which will, in addition to heating the feed water, furnish hot water to be used in the laundry work. This is an example of a new use to which fuel economizers are being put nowadays. There is considerable demand from breweries, bleacheries, &c., where hot water is used in quantities.

Warren Bros. of Boston have just placed an order with the Ruggles-Coles Engineering Company of 39 Cortlandt street for two drying plants.

The American Tube & Stamping Company of Bridgeport, Conn., successors to Wilmott & Hobbs, have placed an order with McClave, Hamilton & Rimmer for a 500 horse-power Ridgeway engine direct connected to generators. The latter concern also closed with the Helvetia Silk Mill of Paterson, N. J., for a 250 horse-power generating set, and with the Heine Boiler Works of Phoenixville, Pa., for a 150 horse-power set.

The Harrisburg Foundry & Machine Company of 203 Broadway obtained the order for the 225 horse-power engine to be installed in the new plant of the Chrome Steel Works, at Carteret, N. J. They also secured the Merck & Co. of Rahway order, and the 150 horse-power generating set for the Union Club, Fifty-first street and Fifth avenue, New York.

The business conducted by the R. H. Wolff Company, Limited, at 118th street and Harlem River, New York City, has been transferred to the Washburn Wire Company of Phillipsdale, R. I. All settlements for purchases, and communications belonging to the Accounting Department, should be sent to the company's main office at Phillipsdale, R. I. All orders, letters pertaining to delivery of goods, claims and complaints, should be addressed to the company at 26 Cortlandt street, New York.

Under the style of Mason & Sloan, D. A. Mason and H. Sloan, mechanical and electrical engineers, have opened offices at 220 Broadway, New York. The new firm propose doing a general consulting engineering business in mechanical and electrical work, furnishing specifications, plans and estimates of power plants, and superintending the construction and installation.

A specialty will be made of isolated plants in office buildings, hotels, stores and private residences.

The New England Structural Company of Boston have contracted to build a power station for the Quincy Market Cold Storage Company of Boston, to be completed May 1. The equipment has not been fully determined upon as yet.

The Bullard Machine Tool Company will on May 1 move their New York offices from 141 Liberty street to 95-97 Liberty street. At their present New York headquarters the company have a wareroom for the display of their tools, but as the works have been severely taxed recently in the matter of deliveries, it has been found impossible to secure tools to exhibit at the New York store. Consequently a suite of offices will suffice.

Machinery Wanted.—H. A. Rogers, 19 John street, New York, are in the market for a machine for planishing the surface of sheet brass from 1-32 to 1-16 inch thick. The machine should also be capable of removing pitting marks from the surface.

Two New Blast Furnaces at Bessemer.—The Carnegie Steel Company have broken ground at Bessemer for the building of two more blast furnaces, which will be known as J and K. These furnaces will be about 90 x 20 feet and will have a daily capacity of 500 tons each. The building of these two furnaces will give the Carnegie Steel Company a complement of 21 furnaces in the Pittsburgh district, consisting of 11 at Bessemer, four at Duquesne, four at Carrie and the two Lucy furnaces. This concern are now the much largest producers of pig iron of any concern in the world. The product of the two new furnaces will be used in the Edgar Thomson mills.

Addresses of manufacturers of and dealers in fuel oil burners are wanted by Marvine Gorham, care of Michigan Bolt & Nut Works, Detroit, Mich.

A New Blast Furnace Plant at Cleveland.

We are able to announce on authority that work will commence immediately on a large modern blast furnace at Cleveland, Ohio. One million dollars of capital has been subscribed. The plant will be located on an extensive site within the city limits. The engineering will be in charge of Julian Kennedy of Pittsburgh. The enterprise is under the management of Rogers, Brown & Co., and will be the fifth of a chain of merchant furnace companies under their control, drawing ores from the Lake Superior region and coke from Pennsylvania—viz., Tonawanda Iron & Steel Company, Buffalo; Punxsutawney Iron Company, Western Pennsylvania; Hanging Rock Iron Company, Southern Ohio, and Iroquois Iron Company, South Chicago. D. B. Meacham of Rogers, Brown & Co. is president, and David T. Croxton, manager of the Pennsylvania Iron & Coal Company of Canal Dover, Ohio, general manager. S. W. Croxton of Cleveland is largely interested. The ownership is confined to a few men of large experience in iron and steel manufacture, besides those above mentioned, including William G. Park of New York, late of the Park Steel Company, Limited; J. G. Battelle of New York, principal owner of the Columbus, Ohio, Iron & Steel Company, and Cleveland parties. Contracts are being let this week for the first of the two furnaces which it is proposed to build. They will be of 400 tons each daily capacity. Bessemer, basic and foundry pig will be made. The office will be in Perry-Payne Building, Cleveland.

The Portsmouth Steel Company, Portsmouth, Ohio, recently incorporated with a capital stock of \$300,000, have completed their organization by the election of the following officers and directors: President, W. L. Glessner of Laughlin Nail Company, at Martin's Ferry, Ohio; vice-president, N. E. Whitaker of Whitaker Iron Works, Wheeling, W. Va.; Alex. Glass and George A. Laughlin of Wheeling, A. F. Baumgarten and T. E. Watkins of Pittsburgh. Messrs. Glessner, Whitaker, Glass and Laughlin compose the Executive Committee. As stated in these columns recently the Portsmouth Steel Company were organized to operate the Burgess works of the Crucible Steel Company of America, at Portsmouth, Ohio, which was purchased by the Maryland Sheet Steel Company of Cumberland, Md.; Whitaker Iron Company of Wheeling, W. Va., and Laughlin Nail Company, at Martin's Ferry, Ohio, for the purpose of supplying the works of those concerns with steel billets. The new company are overhauling the plant preparatory to putting it into operation at as early a date as possible.

The recently incorporated Elmira Rolling Mill Company, Elmira, N. Y., who are to erect a mill with an annual capacity of from 12,000 to 15,000 tons of refined bar iron pig, have purchased a site of 4 acres, and have already started excavations for the works. The property is located between the Erie and Lackawanna Railroad tracks, and near the Northern Central and Lehigh Valley roads, and switches will be run into the yards giving direct connection with all these lines.

A meeting of the stockholders of the Pittsburgh Coal Company of Pittsburgh will be held in Jersey City, N. J., on April 29, for the purpose of voting for or against a proposition to issue \$6,000,000 in bonds. These bonds are to be liquidated in equal annual instalments of \$1,000,000, so that the entire amount will be paid by February 1, 1908. The Union Trust Company of Pittsburgh will finance the deal. The money from the sale of the bonds is to be used to replace the earnings which have been applied to the purchase of coal lands of which the concern have been an extensive buyer for two years.

The directors of the Lorain Steel Company, Lorain, Ohio, have chosen P. M. Boyd to fill the office of secretary-treasurer of the company. He has been secretary of the company since their formation. The office of treasurer was recently made vacant through the resignation of A. C. Gary, who goes to Chicago as credit manager of the Illinois Steel Company.

PERSONAL.

Walter Crooke, Jr., of the Frodingham Iron & Steel Company, Frodingham, England, is one of the recent arrivals from Europe.

Dr. David T. Day has resigned as Chief of the Department of Mines and Metallurgy at the St. Louis World's Fair, and is succeeded by Dr. J. A. Holmes, State Geologist of North Carolina. Doctor Day's resignation resulted from pressure of his many other interests, which prevented his devoting the necessary time to the work of the World's Fair.

Lord Kelvin, the eminent British scientist, sailed for New York on Saturday by the Cunard steamer "Campania."

Charles Schoolar has resigned the auditorship of the Sloss-Sheffield Steel & Iron Company.

Nathaniel Haven of New York has been elected to the presidency of the Structural Steel & Iron Company of Baltimore, in succession to Jules W. Leroux, resigned. Mr. Leroux, who was the founder of the company, continues as a member of the Board of Directors.

Arthur Holland has been appointed acting president of the United Railways of San Francisco, a consolidation of the street lines of that city. Mr. Holland was for many years connected with the well-known firm of iron merchants, Naylor & Co., was afterward established in business at Pittsburgh and subsequently was for years the European agent, in London, of the American Steel & Wire Company and of the Illinois Steel Company.

Julius Beiler, president of the Third National Bank of Pittsburgh and assistant treasurer of the company, has been elected treasurer of the Crucible Steel Company of America, to succeed Reuben Miller, who resigned both as treasurer and chairman of the board on account of ill health, his resignation to take effect May 1.

E. W. Bliss of the E. W. Bliss Company, Brooklyn, N. Y., has gone to Europe for a two months' pleasure tour.

Edward V. d'Invilliers, geologist and mining engineer, announces the removal of his engineering offices to Rooms 9 and 10, 506 Walnut street, Philadelphia.

President J. B. Kebler of the Colorado Fuel & Iron Company has recently returned from an extended tour in Europe.

James L. Brass has resigned as general manager of the Virginia Iron, Coal & Coke Company and has been succeeded by Daniel Davies, formerly auditor of the concern.

The American Brake Shoe & Foundry Company announce the appointment of Joseph D. Gallagher, formerly president of the Lappin Brake Shoe Company, as second vice-president, and Joseph B. Terbell, formerly president of the Corning Brake Shoe Company, as general sales manager.

W. H. Crawford, who has been superintendent of Ella Furnace of the Lacey-Buek Iron Company, at Trussville, Ala., has resigned, and has accepted a position as manager of the Hillman Land & Iron Company, at Grand Rivers, Ky.

J. W. Davis, secretary and treasurer of the A. & P. Roberts Company, has resigned, and will hereafter have charge of the estate of the late Percival Roberts, Philadelphia. Mr. Davis is succeeded as secretary and treasurer of the A. & P. Roberts Company by his late assistant, W. C. Smith.

Hugh Caldrowood, who has been manager of the Collingwood Shipbuilding Company of Ontario, has accepted the post of manager of the Risdon Iron & Locomotive Works of San Francisco.

On April 1 Randolph Bolling took charge as superintendent of the Buena Vista Furnace of the Virginia Iron, Coal & Coke Company, at Buena Vista, Va., having been promoted from the post as chemist of the Crozer furnaces, at Roanoke.

Ernest Porter, formerly superintendent of the blooming mill of the Saron Works of the National Steel Company at Sharon, Pa., has been made superintendent of

the open hearth department, to succeed Samuel Moffit, resigned.

Iron and Industrial Stocks.

Attention during the past week has been so completely engrossed by the Louisville & Nashville incident, in which John W. Gates has been the central figure, that the steel stocks have been neglected. An interesting feature in the market has been the revival of interest in the bicycle securities, all of which have advanced quite materially. International Power & Locomotive preferred, too, have risen under reports of a new undertaking. Colorado Fuel has undergone some fluctuations. The United States Steel conversion plan has not yet been officially announced. A meeting of the presidents of the constituent companies, to be held to-day, has been postponed. It was to decide finally as to the improvements at the plants, which are to call for an expenditure of \$30,000,000 in the aggregate. It is understood that these will include four new blast furnaces and a very large tube plant, to be located at Lorain.

Pennsylvania Steel Company.—The annual report of the Pennsylvania Steel Company shows the net earnings from operations to be \$2,879,272, with \$323,559 additional from rent and income from investments and interest. The gross income from all sources was therefore \$3,202,831, from which is deducted \$550,113 interest on bonded and floating indebtedness, making the net income for the year \$2,653,718. From this sum reserves for depreciation amounting to \$491,211 is deducted, the net gain of the operating companies for 1901 being \$2,161,506. Out of this net gain the operating companies have paid dividends amounting to \$1,150,750, which has gone into the treasury of the company. During the year \$253,662 was expended for improvements. The balance sheet of the company shows the total assets, including cash, loans, stocks and bonds, to be \$27,859,025 and the liabilities, including the capital stock and surplus, a like amount. The old Board of Directors was re-elected.

The United States Cast Iron Pipe & Foundry Company report their balance sheet as of January 31 last as follows:

<i>Assets.</i>	
Treasury stock.....	\$347,555
Unissued stock.....	5,000,000
Plant investment.....	24,062,065
Sinking fund.....	49,377
Cash.....	237,786
Accounts receivable.....	1,579,229
Inventory raw and manufactured material.....	1,421,060
Total.....	\$32,697,072
<i>Liabilities.</i>	
Preferred stock.....	\$15,000,000
Common stock.....	15,000,000
Bonds of American Pipe & Foundry Company.....	1,194,000
Anniston mortgage bonds.....	87,500
Reserve for working capital.....	289,827
Accounts payable.....	543,002
Dividend.....	125,000
Total.....	\$32,239,329
Amount now at credit of profit and loss account.....	\$457,743

The Fore River Ship & Engine Company of Quincy, Mass., are offering for public subscription 10,000 shares of preferred stock at \$100 per share, one share of common stock being given as bonus for each cash share of the preferred. The company are capitalized at \$4,000,000, one-half of which is preferred and the balance common stock. The preferred stock has a non-cumulative first preference on the net profits of the company up to 7 per cent. The charter provides that one-half of the net profits in excess of 7 per cent. on the preferred stock shall be held as a sinking fund for retiring the preferred stock at 125. Of the capital stock there is now \$1,000,000 each common and preferred stock held in the treasury. The company were organized in 1901 under New Jersey laws.

Dividends.—The United Cast Iron Pipe & Foundry Company have declared a dividend of 1 per cent. on their preferred stock, payable June 1.

The Pennsylvania Steel Company have declared a dividend of 3½ per cent. on their preferred stock, payable May 1 to stock of record April 14.

HARDWARE.

THE announcement in our last issue of the lines on which the proposed consolidation of jobbing houses is being effected, and their plans for carrying it into effect, was received by the trade in all parts of the country with the interest to which the importance of the project entitled it. All classes, whether merchants or manufacturers, naturally look at the matter in the light of its bearing on their business interests, but at the same time it has commanded attention from them and from business men in other fields as bringing up broad and important questions concerning methods of marketing goods in Hardware as well as other lines. The subject has thus been canvassed very widely and has been an absorbing trade topic during the week. There has been much inquiry in regard to further details of the plan and the progress made toward putting it into operation, but the matter remains substantially where it was a week ago, there being but little further progress reported. Negotiations are still going on with houses who have not as yet become identified with the consolidation, but if these have in any case been concluded no public announcement has been made of the fact.

The manner in which the large jobbers have for years been endeavoring to cover a wide extent of territory, and some of them almost the entire country, has been recognized by them as well as by the trade at large as one of the serious evils of existing conditions. The method of distributing goods through jobbing houses under prevailing customs is necessarily sufficiently expensive, but this marketing of goods at great distances from the house selling them has not only added to the expense, but has intensified competition and introduced many mischievous trade practices. It has undoubtedly, on the other hand, tended to produce more reasonable and healthful methods, as it has encouraged the establishment of small jobbing houses doing business in territory lying within convenient reach. This class of houses have not only increased in number, but have been doing also an increased proportion of the business. The consolidation is intending to cover the country by one organization, while at the same time by means of its various branch houses the disadvantage of working at long distances from the base of supply is avoided. It will be a very interesting thing to watch the manner in which this principle operates when the plans of the consolidation are put into effect. It is fair to assume that other jobbing houses doing a great business, even far from home, will not give up the field without an effort to retain it, and it may be presumed that they will find means to hold their own against their great competitor. Necessity will doubtless stimulate their already abundant enterprise. The small jobber has of late been making a large place for himself in the trade, and by careful cultivation of the ground which lies within easy reach he has been able to market his goods at a smaller percentage of cost than has the great jobber. Under these influences it is not likely that the small trade will be neglected, or that their opportunities for satisfactory buying will be materially curtailed.

In regard to the great question as to what will be the future of the consolidation and its effect on the trade there is on the part of merchants and manufacturers generally a disposition to reserve judgment until the plans of the consolidation are more definitely ascertained and there is time to find what will be the atti-

tude of the manufacturers and the retailers toward it. Many persons whose judgment is generally good on trade questions evidently regard the project with only a very moderate confidence as to the ability of the consolidation to effect any radical change in the methods of distributing Hardware. At the same time it is reasonable to suppose that the combined houses will be able to do at least as much business as they did when separate. There is no apprehension that important manufacturers who occupy an independent position will limit sales to the new company, or be in any way subservient to it. The impression prevails that the independent jobbing houses will be able to hold their own, and some of them are looking forward to the new conditions as giving them an advantage in the marketing of their goods. Manufacturers are naturally somewhat reserved in open expressions of opinion, as they do not desire to antagonize the new company or to judge it prematurely, but at the same time many of them evidently entertain doubts as to the practical feasibility of the project. The retail trade, like the trade at large, are in a waiting attitude, but that they are disposed to look with some disfavor on the new company because of its being a combination, and thus sharing in the popular dislike of such aggregations, is indicated in the letters which are given in the following pages. The trade is thus in an attitude in which the further development of the great project will be awaited with curiosity or solicitude, but comparatively little apprehension. In the meantime all classes agree in regarding the consolidation as a most interesting experiment in commercial matters, the results of which may be far reaching.

Condition of Trade.

Reports indicate that trade throughout the country is in excellent condition and large volume. It is, however, feeling to some extent the effect of the spring activities. Travelers agree in reporting that labor throughout the country is so well employed and new enterprises are being so liberally projected that the stores generally are doing a large and profitable business. It is evident, too, that building during the season will be active. Prices on practically all lines of Hardware are firmly maintained, and in many departments there is an upward tendency. This condition is illustrated by the advance made during the past week in the price of Builders' Hardware. The difficulty experienced in obtaining many goods as promptly as the demands of the trade require gives additional firmness to values. The matter of jobbing consolidation has naturally been the subject of much discussion, and the different departments of the trade are canvassing it in the light of their individual interests. Export business is in very satisfactory shape, and the receipt of large and varied orders from foreign buyers is reported. In some lines the relatively high prices ruling in the home market have the effect of diminishing the amount of export business, but on the whole there is an increasing volume and an enlarging variety of Hardware and metal products going abroad. There is comparatively little complaint in regard to collections, and the financial situation of the trade in general is regarded as eminently satisfactory. It seems probable that the excellent record made by the opening months of the year will be continued, and the trade are looking forward to a large and profitable business during the remainder of the year.

Chicago.

(By Telegraph.)

The volume of business is running far in excess of that of last spring. Some of the Western jobbing houses

report a 40 per cent. gain in their trade. The scarcity is becoming decidedly pronounced in such articles as are now getting into use with the advance of spring. Screen Doors are exceedingly hard to get. Wire Cloth is in very limited supply, and jobbers have advanced their price to \$1.10. This price hardly represents the situation, as the best price named by a manufacturer to a large jobber on a carload order the past week was \$1.25. Jobbers further West are so short of goods in many lines that they have been endeavoring to place orders with Chicago jobbers. The prosperous condition of the country is shown by the improved demand for Bicycles. One house report as many Bicycles sold thus far this year as during the whole of last year. Heavy orders are being placed for Bale Ties both for immediate shipment and for future delivery. A sharp advance has just been made in Builders' Hardware. The manufacturers in this line held a meeting in New York last Thursday at which all concerns were represented and decided to make an advance of 20 per cent. on the full line to take effect immediately, no orders whatever to be accepted at old prices. Heavy Hardware jobbers report an unbroken stream of orders for iron and steel, which keeps these stocks moving out as rapidly as shipments are received from the mills. The demand for all classes of manufacturers' supplies and Wagon and Carriage Goods is very large.

St. Louis.

(By Telegraph.)

It is remarked among the jobbers that spring business is moving in very large volume, and from all localities the preparations are along the line of meeting the customers' demands promptly. The call for Steel Goods of all descriptions is large, and Garden Tools are not far behind in point of favor. It is hardly necessary to single out any particular items of goods for special mention, as the activity is apparent through the whole list of seasonable specialties. In the heavy department of the market some revising of prices has been in order this week. The quantity of demand in the heavy line is referred to as very good.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—We are glad to be able to report that trade is good, unusually good for this season of the year, although many things have occurred since the first of the year to interrupt the usual course of business. The last trouble we had was the tremendous flood, from the effects of which we have just recovered. This flood seems to have done little permanent damage to crops, but the loss from various sources, particularly railroads, county bridges, injury to farm lands, &c., amounts to several million dollars. The demand for Wire Fencing, Barbed and Plain Wire has been unusually heavy at this season of the year. This is partly accounted for by the fact that many fences were recently washed away. Jobbers are experiencing a great deal of difficulty in getting a supply of Barbed and Plain Wire.

The all absorbing topic in Hardware circles is the amalgamation of Hardware jobbing houses, which it appears from *The Iron Age* this week is fully consummated. The general impression in this community seems to be that if they are able to carry out in good faith the liberal policy that they have outlined they will soon remove any prejudices against them that may now exist in the minds of the people.

Cleveland.

THE W. BINGHAM COMPANY.—The demand for general Hardware in this section is exceedingly good in all lines. Artisans all over the country seem to have plenty of work and are requiring large quantities of material of all kinds in the general Hardware, Mining and Milling Supply lines of goods.

Indications of good weather and an early spring opening prompt customers to order freely and frequently, and with the opening of lake navigation, which will come now in a week or ten days, we expect to have an extra demand for our large lines of goods from all sections of the country.

Collections are fairly good. Merchants seem to have plenty of money to pay and discount their bills moderately promptly. The general outlook for spring trade in this section is very encouraging.

San Francisco.

PACIFIC HARDWARE & STEEL COMPANY.—This time of the year is a very busy season, especially as the salmon canneries in Alaska commence to outfit for the season, and it requires a great many vessels to carry the supplies for them. This time of the year transportation companies start in to get ready for the passenger travel to Alaska. From the outlook it looks as if the trade with Alaska and nearby countries will be much larger than it was last year.

Business in all lines still continues good on the coast, and the demand for all kinds of Hardware is large, orders coming in more freely than last month, as the country is in first-class condition as regards farming interests.

Omaha.

LEE-GLASS-ANDRESEN HARDWARE COMPANY.—During the past two weeks the business situation has remained in practically the same condition as outlined in our former report, with few changes of any kind and none of importance to distinguish this period from prior weeks. A free movement of merchandise still continues, and although agriculturists are just now busy in the fields with spring work, still the volume of trade is sufficient to satisfy the most exacting.

Many lines of seasonable goods are extremely scarce, and as the demand seems in some cases to be largely in excess of the supply, the jobbing trade are finding it a difficult task to supply the requirements of their customers with the regular degree of promptness.

The conditions prevailing at present in the agricultural regions are all that could be desired. There is a good demand for all the products of the farm and at prices that are notably profitable. So, also, the conditions are favorable to the employment of labor, and there is comparatively little idleness to be observed anywhere in this section of the country, while as a rule wages are somewhat higher than a year ago.

It is to be hoped that the present healthy condition of business will continue indefinitely, and with a bountiful harvest it is probable that the latter half of the present year will witness an unprecedented volume of business.

Louisville.

W. B. BELKNAP & Co.—The market for all materials continues strong, and with the example set to the trade by the large users of raw material buying from six months to a year ahead, it would be difficult not to be inspired by confidence as to the future. There is a good deal of buying for forward delivery of all kinds and no complaints except from those sections where the crops were exceptionally short of corn and cotton. The money for early spring fruit and vegetables in the country immediately south of us will begin to move soon and we anticipate improvement in collections.

There have been quite a number of failures among the small traders, but this is only to be expected after a considerable period of immunity. The outlook is propitious, and there are an infinite number of schemes for mining coal, drilling for oil and cutting away timber. This State is particularly well provided with not only hard wood timbers for wagon stock, but with the variety of woods designed for ten pins, baseball bats, &c., and large shipments are being made from here to Chicago and other points north of these woods. There is a school of forestry connected with Berea College in Madison County, this State, of which those interested in the preservation of our forests, or rather in the proper use of their growth, have great hopes. To those who would obtain a little insight into what modern forestry means, we would strongly recommend the article in the *Atlantic Monthly* for April, entitled "The Day's Work of a Forester."

Of course, much interest has been roused here, as elsewhere, by the Hardware consolidation or combination. It is hoped and believed that certain trade abuses,

the outgrowth of unreasoning or unrestricted competition, may be corrected through the powerful agency of such an aggregation. If, as one of our orators recently declared, we are making history faster than any one can read it, it may be equally true that we are writing new chapters in political economy faster than they can be printed. At any rate, those who come after us, if we do not live long enough, will have some interesting deductions in the class room, which those of us who went to college a few years ago missed altogether, just because the economic world had not progressed so far.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—Trade is moving in the same strong volume heretofore reported. While the weather is cold and backward for the season in this section, no harm has resulted, and prospects are as bright for the future in all lines of business as ever in the history of the Pacific Northwest.

Here in the city building operations are frequently held up for lack of material, particularly in mill work, as our sash and door factories have established such a reputation for Oregon fir and cedar that several run altogether on Eastern orders, cutting off so much capacity otherwise available for local demands.

Expansion is seen everywhere, both in manufacturing, jobbing and retail trade.

Collections are good for the season when there is nothing in line of farm products moving, the market having been well cleaned up.

NOTES ON PRICES.

Wire Nails.—The Wire Nail market continues in excellent condition. The volume of business is large and merchants have some difficulty in obtaining shipments as promptly as their trade requires. Stocks, accordingly, throughout the country, as well as in the warehouses of the mills, are broken. The market is characterized by a decidedly firm tone and little complaint is made of concessions in price. Quotations are as follows, f.o.b. Pittsburgh, 60 days or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.05
To jobbers in less than carload lots.....	2.10
To retailers in carload lots.....	2.10
To retailers in less than carload lots.....	2.20

The regular differentials between the prices to jobbers and retailers are apparently more regularly maintained than they have been, as well as on carload and less than carload lots. The facts are that at the prices now prevailing the cost of production is such that manufacturers, especially those who have not the best facilities, are obliged to adhere closely to the schedule in order to realize a suitable profit. Prices are more regularly maintained by the manufacturers than by the jobbers, who are cutting to some extent. In the strenuous competition which exists Nails naturally take their usual place as leaders.

New York.—There is little change in the character of the local demand for Nails. The indications are, however, that the volume of business will continue to be quite satisfactory. There is some scarcity and merchants' assortments are somewhat broken. The market is represented by the following quotations: Small lots from store, \$2.30; carloads on dock, \$2.18 to \$2.20.

Chicago, by Telegraph.—The volume of business in Wire Nails is heavier than at the corresponding time last year. The factories are not able to make prompt shipments, although straining their capacity. Jobbers report a heavy demand both from city and country trade. Prices are unchanged at \$2.20 for single carload lots and \$2.25 to \$2.30 for small lots.

St. Louis, by Telegraph.—The volume of demand for Wire Nails is keeping well up to recent reports and is said by jobbers to be very heavy. Small lots from store are quoted at \$2.30.

Pittsburgh.—Many of the Wire Nail mills seem to be oversold and on account of lack of shipping facilities are unable to make prompt deliveries. New business

coming in is heavy and the outlook is that the product of the Wire Nail mills will be taken as fast as made for some months. It is said a few of the outside mills do not closely observe the established differentials in prices between jobbers and retailers. However, the tone of the market is very firm and we quote Wire Nails at \$2.05 in carloads and \$2.10 in small lots, f.o.b. maker's mill.

Cut Nails.—Notwithstanding the fact that the price on Cut Nails is substantially the same as that of Wire Nails, there is a good demand for them and mills are, in fact, unable to make prompt shipments. This is principally on account of the difficulty they experience in getting the material from which to manufacture them. Prices are quite steadily maintained. Quotations are as follows, f.o.b. Pittsburgh, plus the actual freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....	\$2.05
Less than carload lots.....	2.10

New York.—The trade in the New York territory is in a very satisfactory condition, and with the building that is in progress and projected there is a good demand for Nails. Quotations for carloads and less than carloads are as follows:

Carload lots on dock.....	\$2.18
Less than carload lots on dock.....	2.23
Small lots from store.....	\$2.25 to 2.30

Chicago, by Telegraph.—The activity in the building trades causes a much greater demand for Cut Nails. Small lots are now quoted at \$2.30. This is noteworthy, as it represents a higher rate than that asked on Wire Nails.

St. Louis, by Telegraph.—A fair demand for Cut Nails is to be reported, with the quotation at \$2.30 for small lots from store.

Pittsburgh.—There is an increasing demand for Cut Nails, and the inability of the mills to get Steel as fast as needed still causes some delay in making shipments. The tone of the market is strong, and we quote Cut Nails at \$2.05, base, in carloads, and \$2.10 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination.

Barb Wire.—There continues to be a satisfactory and large demand for Barb Wire, notwithstanding the advance of the season. Prices are firmly maintained, and are represented by the following quotations, f.o.b. Pittsburgh, 60 days, or 2 per cent. for cash in 10 days:

	Painted.	Galv.
To jobbers in carload lots.....	\$2.60	\$2.90
To jobbers in less than carloads.....	2.65	2.95
To retailers in carload lots.....	2.70	3.00
To retailers in less than carloads.....	2.80	3.10

Chicago, by Telegraph.—The trade are again taking lessons in patience waiting for shipments of Barb Wire from the factories. The demand is in excess of manufacturers' facilities, notwithstanding the increase made in this respect as compared with their condition last year. Jobbers are enjoying a heavy trade, which, however, is interfered with to some extent by inability to make deliveries as promptly as they would like. Prices are unchanged at \$2.80 for Painted and \$3.10 for Galvanized in single carload lots, with 5 cents extra for small lots.

St. Louis, by Telegraph.—The volume of demand and inquiry for Barb Wire is reported by the jobbers to be active and large, with prices the same as last week. The quotation in small lots is \$2.90 for Painted and \$3.20 for Galvanized.

Pittsburgh.—Both manufacturers and jobbers report a heavy demand for Barb Wire, and there is still some delay by the trade in getting prompt shipments. Prices are strong, but without change. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days: Painted, \$2.60; Galvanized, \$2.90; less than carload lots, Painted, \$2.65; Galvanized, \$2.95.

Plain Wire.—The mills are still behind in their shipments of Plain Wire, and the volume of business thus far is considerably in excess of that in a similar period of last year. Quotations are as follows:

NEW COAL TAR PRODUCTS ASSOCIATION.

THE constant consolidation of manufacturing and distributing interests is again supplemented by the addition of another important industry to the already long list of such concentrations. We refer to the recent combination of the manufacturers of Coal Tar products under the name of the Coal Tar Products Association of the United States of America. This organization includes nearly all the manufacturers of this line of goods in the United States, and Jenkins & Hardy, 100 William street, New York, are the official representatives of the manufacturers, who have joined forces to regulate and advance the prices of this line of goods. These advances represent an average increase of approximately 20 per cent. on Tarred Felts and Roofing Materials of this character.

The prices which have been decided upon vary from a minimum figure ruling in metropolitan territory—that is, the City of New York and territory immediately adjacent thereto—to higher figures for the goods delivered in the Southern States, as follows:

	Metropolitan territory. Carloads.	Southern territory. Carloads.
Tarred Felt, per ton.....	\$29.00	\$35.00
" " 2-ply light, per roll..	.50	.65
" " 3-ply light, per roll..	.77	.85
" " 2-ply heavy, per roll..	.60	.75
" " 3-ply heavy, per roll..	.87	.95
Slaters' Felt, per ton.....	34.00	40.00

The following prices are for less than carloads or mixed carloads, and on goods the association are not competent to make absolute prices on, as they do not control the product—viz.:

	Metropolitan territory. Per ton.	Southern territory. Per ton.
Rosin Sized Sheathings.....	\$30.00	\$38.00
Deadening Felt.....	35.00	45.00

The prices as given above do not include one extreme Southern point, Tampa, Fla., which are fixed on a basis of \$38 per ton on Tarred Felt as against \$35 as above, the other items being advanced in proportion.

Boston prices average about 5 per cent. higher than New York prices, except on Deadening Felt, which is \$3 per ton less than New York prices.

The territory embraced by the range of prices given covers what is known as the New England, Middle and Southern Atlantic States, which strip has been comprehensively divided into 18 divisions in great detail. The cities of Boston, Providence, New York and Philadelphia, which are in a sense manufacturing points, take minimum prices, while the territory most distant from these points take higher delivered prices, the difference being mainly the cost of the freight. The prices for less than carloads average from 10 to 20 per cent. higher than carload prices quoted above, depending on the cost of delivery.

The weights of 2 and 3 ply and Slaters' Felt have been increased about 5 pounds per roll over the old weights for low priced goods.

No prices are made on straight carloads of Tar, Rosin Sized Sheathings and Carpet Linings.

Another provision is that no contracts shall be made and all prices are subject to change without notice.

A concession of 5 per cent. will be made to purchasers of either 150 tons of Pitch or 100 tons of Felt within a stipulated time.

This association is simply an agreement among the manufacturers of this class of merchandise, to control and regulate prices, and is not a consolidation of various units into one company.

AMERICAN STEEL & WIRE COMPANY.

AMERICAN STEEL & WIRE COMPANY, Chicago, New York, Denver, San Francisco and Worcester, have just issued catalogue No. 5, relating to Extension, Compression, Torsion and Flat Springs in great variety. They state that all Springs requiring nicety of action are fully tested before leaving their works, thus insuring against the shipment of any that may be defective.

NEW ENGLAND HARDWARE DEALERS' ASSOCIATION.

THE April meeting of the New England Hardware Dealers' Association was held at the United States Hotel, Boston, April 9. The Executive Committee convened at 4.30 p.m., after which dinner was served. Following the dinner the topics for discussion for the evening were taken up, as follows: "The General Business Outlook," "Outlook for the Hardware Trade with Forecast of Prices," and "How Can the Retailer Best Maintain Fair Prices?"

The members spoke freely upon the above topics and it was the consensus of opinion that business was far ahead of last year both in volume and prices and that the outlook was bright in the building lines, with prospect of good prices. The only uncertain element was the attitude of labor, which, however, was expected to be adjusted satisfactorily. The method of maintaining fair prices which seemed to be most successful was through the acquaintance in each locality of the several merchants and the liberal use of the telephone between them to smooth out little differences, which if not attended to immediately become so large that neither party cares to undertake to straighten them out, with the inevitable result of price cutting. It was pointed out that the continued combining of manufacturers and jobbers should make it apparent that the retail merchants must get together and have the benefit of concerted action. The following took part in the discussion: Charles E. Adams, Myron H. Tarbox, William D. Parlin, George W. Burditt and John B. Hunter.

On motion of Charles E. Adams it was voted

That the members of the New England Hardware Dealers' Association are in full sympathy with the proposed Old Home Week annual celebration commencing July 27, 1902.

Resolved, That the delegates from this association to the Massachusetts State Board of Trade be instructed to present this resolution to that organization for their consideration.

In speaking to the resolution Mr. Adams said that there was about 500,000 people who were born in Massachusetts who now reside out of the State, and of the pleasure and benefit it would be for them to spend the week in their home State.

William H. Warren, a former member of the association, was re-elected to membership.

Amendments to the by-laws permitting the Executive Committee to change dates of meetings when necessary were adopted.

The members then listened to an interesting address on "Banks and Banking," by Francis B. Sears, vice-president of the National Shawmut Bank of Boston. On motion of the secretary, Mr. Sears was tendered the thanks of the association for his interesting and instructive address.

The attendance at both the executive meeting and business meeting of the association was highly gratifying, evidencing the renewed interest of the members in the good work of the association. At the executive meeting 11 of the 12 members were present, which was the largest attendance for some time. The attendance at the dinner was very large and a keen interest was shown in the topics discussed.

It was announced that the principal guest of the association at the May 14 meeting would be Capt. J. W. Collins, chairman of the Fish and Game Commission of Massachusetts, who will talk on the subject "Fisheries and Fishermen."

PEDEN IRON & STEEL COMPANY.

PEDEN IRON & STEEL COMPANY, Houston, Texas, who have just succeeded Peden & Co., with increased capital and facilities, have issued a catalogue covering their wholesale business in Iron and Steel, Heavy Hardware, Roofing Material and Mill Supplies. It is a volume of more than 400 pages and represents many new lines of goods which have been added to their stock since their former catalogue was distributed.

Roberts & Connell have been succeeded by Roberts & Vernon in the Hardware, Stove, Farm Implement and Sporting Goods business in Lewiston, Mo.

BRITISH LETTER.

Office of *The Iron Age*, HASTINGS HOUSE, }
NORFOLK ST., LONDON, W. C. }

The Hardware Trade After the Easter Holidays.

THE last fortnight has been broken into by the Easter holidays, and even yet many of the Hardware factories in Birmingham, Wolverhampton and elsewhere are working half time. Little inconvenience has been caused, owing to the slackness of orders. Some firms with army contracts are kept busy, but otherwise, speaking generally, there is but little doing. Although the brass and copper trades are recovering from the disturbance caused by the copper crisis they are still in a somewhat unsettled condition, and as regards Tubes, Sheets and Wire, German competition is at the present time taking a considerable portion of British business. It is stated that the extent of British losses in these departments is not fully realized because the business still flows through British mercantile channels, but the goods are being made in increasing quantities in Germany. It is openly stated, and, indeed, admitted, in Birmingham that German metal rollers are now not only selling at lower prices, but making a superior gauge and finish. Light iron foundry work is well occupied just now, the demand for malleable goods for household purposes being quite heavy. Makers of Nuts and Bolts are busily engaged, as are also the Cycle industries and the enameled sign manufacturers. Vermin Trap makers have recently received a large number of oversea orders, while the makers of bright Tinware are kept busy. On overseas account, good trade continues to be done with Australia and New Zealand, and large consignments are going to Cape Colony. Business with South America, however, is slow, while trade with India, Europe and Canada is slackening off. The same may be said more emphatically of China and the Far East. An interesting report comes from Sheffield in regard to the Sheep Shear trade. During the last few weeks manufacturers of Sheep Shears should have been busy with the demand from South Africa, but between the English and the Boer forces the work of slaughtering sheep has gone on more rapidly than breeding them. The fear is that it will be many a year before there will be such flocks in that country as will lead to any brisk demand for Shears such as has been known in the past. The Australian market was rather better, but on account of the poor season it was not up to the average. The Sheep Shearing Machine has not taken on in some districts as generally as at one time it was expected it would do, good Hand Shears being preferred. Some firms have done very well with the Russian market this season, and it is now about over. In South America the season trade is moving, and from inquiries that are being made, and the orders that have been placed, full average sales are anticipated. Comparatively few machines have found purchasers in that country.

The Metal Trade with France.

I have extracted the following from a return of goods entered at the port of Havre during the years 1900 and 1901. I regret I cannot state the amount in currency, but only in tonnage. Most of the goods noted hereunder are not for the city of Havre, but for departments of France situated inland:

	1900. Tons.	1901. Tons.
Cast iron, hoop iron, steel wire, steel, &c....	696	284
Copper	584	1,228
Aluminum bronze.....	2	....
Lead	24	104
Tin	60	103
Zinc	4	2
Nickel	4	....
Machinery	317	442
Agricultural Implements.....	82	103
Sewing Machines.....	4	....
Tools	18	21
Boilers and Gasometers.....	10	14
Detached pieces of machinery.....	187	135
Ironmongery	228	141
Anchor, Chains and Cables.....	93	96
Iron Tubing.....	270	107
Household Ware (Iron or steel).....	31	24
Articles in copper, lead or tin.....	23	21

Sheffield Exports to America.

The following were the shipments from Sheffield to America for the quarter ending March 25 of this year. I regret I cannot differentiate between shipments to Canada and the United States. The following figures, however, indicate that Sheffield still supplies Cutlery in large quantities to your side, while the large item for steel is doubtless crucible steel:

Cutlery	\$73,475
Electroplate	1,480
Horn and manufactures of.....	21,865
Measuring Tapes.....	8,065
Machinery	2,000
Pearl and manufactures of.....	11,390
Sheep Shears.....	28,385
Steel Die blanks.....	1,345
Steel	415,640
Trees	1,935
Tires and Axles.....	1,180
Vegetable Fiber.....	820
Grindstones	1,725
Hair	1,105
Raddle	855
Razors and Edge Tools.....	5,780
Miscellaneous	5,995
Total.....	\$583,040

The Scissors Trade.

The discussion upon the Sheffield Scissors trade still continues, although intermittently. It is now recognized that the British tailors almost invariably prefer American to any other form of Scissors. The reason given is that they are easier to work. It is further admitted in Sheffield that this craft is in a very bad way. Wages are low, prices are cut, and there seems no disposition to introduce new machinery or new methods to meet modern requirements. The workmen themselves appear to be blind to their own best interests, but it would appear that the masters are equally conservative. Meantime, the German Scissors and American Scissors are making good headway over here and are bought readily.

DEATH OF J. V. MILNER.

J. V. MILNER, one of the oldest merchants of Bloomington, Ill., died on the 2d inst. Mr. Milner settled in Bloomington in 1854, and with his brother-in-law, C. W. Holder, and R. H. Holder, formed a partnership under the style of C. W. Holder & Co., in the Hardware, Agricultural Implement and seed business. About 1864 R. H. Holder withdrew from the company and R. E. Brown and J. D. Fowle became connected with them, and the new firm were styled Holder, Milner & Co. Subsequently Mr. Fowle and Mr. Holder withdrew, the latter turning over his interest to Dan Holder. In 1899 the house were incorporated under the name of Holder-Milner Hardware Company. Shortly afterward Mr. Brown sold out his interest, and at the close of 1900 Mr. Milner also sold out. The style of the concern was changed to Holder-Athey Hardware Company. In the spring of 1901, Mr. Milner, his son, Walter, and daughter, Jennie, formed the J. V. Milner Hardware Company, and reopened the old store building. After Walter Milner's death last July, Rudolph Strehlow of Peoria joined the company, who continue under the same name.

M'KINLEY MEMORIAL ASSOCIATION.

THE final meeting of the Auxiliary Committee of the Hardware and kindred trades of the McKinley National Memorial Association will be held at the rooms of the Hardware Club at noon on Saturday next, 19th inst. We are advised by Thomas F. Keating, chairman of the Auxiliary Committee, that it is desired to close the matter of contributions to the fund, and the treasurer will make his report of receipts to date at the coming meeting. It is desirable that there should be as large a showing as possible, as it is expected of the Hardware trade that it will make good returns, and those who have not as yet contributed are requested to forward their contribution to the treasurer or chairman of the committee without delay.

THE JOBBING CONSOLIDATION.

If it is understood that negotiations are in progress with other houses, but we are without definite confirmation of the reports. It is known, however, as stated in our last issue, that several houses are considering the question as to whether or not they will enter the consolidation.

Whatever may be the development of new enterprises in the jobbing field as a result of the consolidation—and there is little doubt that this will be one of its early effects—it is probable syndicate buying will receive a stimulus. Of the 52 houses who have been named as going into the new company, it is significant that considerably more than half have representation in New York City, and almost all of these are syndicate buyers. Since it has been evident that the consolidation would be consummated there have been an unusual number of inquiries from merchants desiring such representation.

Reports are current that some of the houses whose names were published in our last issue as identified with the consolidation deny any such connection. The only house, however, who have intimated to us that there is any error in publishing their names as parties to the aggregation are Mathews & Boucher, Rochester, who advise us as follows:

To the Editor: Notwithstanding we found ourselves in very good company when included with a number of the representative jobbers of the country as "Parties to the Consolidation," yet we were somewhat surprised to find our names given as members of that organization. We have not joined it and have no expectation of doing so, and we will, therefore, be obliged to you if you will so state in this week's issue of *The Iron Age*.

MATHEWS & BOUCHER.

Letters from Manufacturers in Regard to Consolidation.

The engrossing interest felt by the trade in the matter of consolidation is indicated in the following letters which have been received from manufacturers in which the subject is discussed in various aspects:

From Prominent Manufacturers in Indiana:

We can see no objection to this consolidation on the part of manufacturer, competitor or dealer, provided the promoters and managers are of sufficient ability to foresee the necessity of conservatism and proper consideration of all other interests. In fact, upon this depends the success of the movement.

Should there be any determined attempt to dictate prices to manufacturers, or otherwise arbitrarily control the situation, trouble is sure to ensue, and of such character as to eliminate the possibility of a profit to either manufacturer or jobber.

We do not imagine that business on certain lines of goods will be thrown exclusively to one or two manufacturers, or that an effort will be made to exploit a new and less known line to the detriment of that of some old and well established manufacturer.

We believe in the thing if rightly managed. It is a natural evolution, and is but another step to a certain end that is coming as sure as fate.

What the Consolidation can do to Promote the Sale of Good Goods:

The possibilities of permanent betterment of the manufacturers' interests, if the consolidation now being discussed is carried into effect, can hardly be estimated, providing those entering the consolidation are in the majority those who favor handling good goods. If the opposite policy is pursued—i. e., the quality of goods

bought is not considered and price only sells the goods, it will be mighty hard sledding for manufacturers, and will be ultimately so for those in the consolidation.

Our experience is that many large distributors want goods as represented. Another considerable number of distributors will take 12 ounces for a pound and 19 yards for 25 yards, if the price is sufficiently low and the goods are marked full weight and full length, they claiming they must have goods that will compete in price, but jobbing houses consolidated would completely upset any force to such an argument, and manufacturers of standard goods when favored with the orders of the consolidated jobbers would be in position to furnish the best goods that could be manufactured at prices that would be competitive with very much inferior goods manufactured by parties who only manufactured a few articles in a line.

The quality of the manufacturers' goods recognized, everything would tend to strengthen the established manufacturers who are making full lines of goods, and much increase their production of goods, though we believe it would add but very little increased profits, but would be an element of great strength to manufacturers, and while they would be constantly forced to better the quality of their goods, they would be in position both as to quality and price to sell their product in any country or market where goods in their lines are in demand.

From a Prominent Massachusetts Manufacturer:

Time brings great changes. What is a fact to-day may not be to-morrow. A short time ago it was a fact that intelligent communication could not be transmitted at long distances by electricity without the intervention of a wire. To-day it is a fact that it can be done. Only a few years ago it was thought that successful combinations could only be consummated by railroads and by corporations of public utility; later on it was found that producers of a standard article like refined sugar or refined oil were added to the list; then came the attempt to consolidate manufacturers of different grades and styles of goods, and then came the gigantic Steel Trust, taking the ore from the ground and producing articles of multitudinous variety. Now comes the proposition to consolidate large commercial houses.

In the cases previously mentioned they all have to some extent protection in the following particulars:

1. Protection by patents.
2. Protection by having skilled workmen.
3. Protection by controlling source of supplies.
4. Protection by having intricate and money saving machinery that cannot be easily duplicated.
5. Protection in the strength and prestige of great capital handled by men of exceptional business ability.

It is easily apparent that the proposed consolidation of the Hardware jobbing trade has but one out of the five sources of protection enjoyed by the combinations first mentioned. Should there for any reason arise a situation that would deprive them of this one means of protection the result would be disastrous. Any one with capital and brains can establish the business of a wholesale jobbing house. The present competition cannot be wiped out for the lack of the important means of protection offered the combinations first named. For this reason many sources of economy opened to the former are absolutely closed to the latter. Undoubtedly the combination of all sorts of commercial enterprises is in the air, but the very last that will successfully come into line will be the consolidation of this class. What is to become of the many bright and active men who are thoroughly equipped with a complete knowledge of the business, and with an extensive and cordial acquaintance with the general trade? Cannot these men secure both capital and the good will of the trade?

It may be that in the far future all of the industries of the country will be under one head, and that may be the Government itself, for it would be a far mightier organization than the Government, and would either con-

trol the Government or the Government control it. Would the people submit to the former or force the latter condition? Time will tell.

An Unpleasant Contemplation, Says a Pennsylvania Manufacturer:

The subject has not been a pleasant one for us to contemplate, but so far we have not figured out just exactly how this consolidation will affect our interests or whether it will be a good thing to invest our surplus earnings in.

We know that we are living under new conditions at the present time and our past experience is not of much use to us.

Views of an Ohio Manufacturer:

We feel rather reticent about expressing any opinion regarding the proposed consolidation of the Hardware jobbers. If practically all of the large jobbers can be brought in and the financial basis, organization and management of the enterprise are right there would seem to be a good possibility for success, though in our judgment the jobbing proposition does not present anything like the advantage for consolidation that is offered by certain manufacturing lines.

It seems almost certain to us that in event of the consolidation being consummated, thus uniting various houses, there will be quite a number of good Hardwaremen dropped out. Some of these parties will be very apt to become immediate competitors, getting together a sufficient amount of capital to become important factors in the trade.

From a broad standpoint we are of the opinion that the general result would not be good.

Manufacturers May Become Their Own Distributing Agents:

As small manufacturers, distributing our goods through wholesale houses, we do not look with much favor on consolidation of jobbers. With 50 buyers to deal with our chances of business are 50 times better than with the 50 consolidated into one. We might meet with favor in the eyes of the buyer of the consolidation one year and be left out the next, the result of which would be to drive us to the retail trade, which in turn, for economy's sake, would result in the consolidation of the manufacturers' selling departments somewhat in this way: A number of manufacturers of noncompeting goods join together, putting their goods in the hands of a distributing company and establishing warehouses in various parts of the country, travelers covering the country from warehouse points and shipment being made from there, except where orders might be large enough to warrant direct shipment from the factory, virtually making the manufacturers their own jobbers or distributing agents.

Of course the jobbers' consolidation may work out differently from what it appears at present. As this is a time of changes in business methods, we will have to await developments to see how it will actually work out.

Views of a Well-known Traveling Salesman:

From my point of view I do not look with favor on the consolidation of Hardware jobbing interests, as it may tend to antagonize manufacturers, or at best force them to make concessions in the way of prices to jobbers who are part of the consolidation and to the class of trade they sell. Furthermore, I cannot believe it will prove a permanent success, because they have nothing to base such a concession on save their past experience and anticipated business. I believe they are arrogating to themselves more than there is reason to believe will be realized by the progress of events, because it will be the tendency of the manufacturers' traveling salesmen to build up other business.

A Prominent Manufacturer Has Something to Say About Consolidations in General:

I do not believe that I know enough about the situation to write anything of any value. I have been closely confined here hustling to get out goods enough to fill our orders. Now if a lot of the jobbers have consolidated we shall hope to get their orders. I have never thought that such a combination would go through, and if it did go through it has been my opinion that it would not be a lasting success; but the longer I live the more I find I do not know. I think that in any event it "will gang its ain gait," and if it proves the greatest good for the greatest number it has my hearty wishes for success. If, however, it is one of those exaggerated capitalized companies who expect to pay large dividends on a lot of stock that represents nothing but good will, I do not see how or why it should prove a permanent success. But I really know nothing about the situation, have no inside information, and have given it so little thought that my opinion about the matter can be of no value.

The gigantic corporations that have been formed in the last few years and the new methods of flanciering are more than I can grasp. Taking a few small corporations from different parts of the country into New Jersey and turning them into the hopper of the incorporating mill there, they seem to come out many times enlarged into a great, beautiful, big dividend corporation with high salaried officers, and everything seems to go on flourishing, everybody rich and happy. The country seems to prosper and flourish under this condition of things, and I only hope it will continue, but I fear there must be disaster somewhere ahead. And I am fearful that the trouble when it comes may be as large in proportion as the schemes have been that bring it upon us. But I am not in the habit of taking this pessimistic view in general matters and I certainly hope that my fears in this direction will not materialize.

The Consolidation and the National Hardware Association.

THE fact that many of those prominently identified with the jobbing consolidation are active members of the National Hardware Association has suggested in the minds of the trade some question as to the effect the organization of the new company will have on the association. This matter was touched upon by T. James Fernley, the secretary-treasurer of the National Hardware Association, when in conversation he expressed his views on the subject substantially as follows:

In reply to your question as to the effect the consolidation of several houses, as announced in *The Iron Age* of April 17, will have on the National Hardware Association, I would say that I cannot see any disadvantage to the organization in having a number of its members buy an interest in each others' concerns in the manner so fully described in your columns.

Your editorial to-day treats of the possibilities of the future in an able and exhaustive manner. The situation is viewed from all standpoints.

Many of the gentlemen whose names are mentioned have been very active in the work of the National Hardware Association. They have admitted that there was great necessity in the trade for the maintenance of such an organization. The manufacturers of the country have frequently stated that it was to their interest that the National Hardware Association should perform its mission. At the time of the formation of the American Hardware Manufacturers' Association in Cleveland the officers of this association stated that it was their earnest desire to co-operate with our organization, and I learn that this desire has been intensified during the last few months at the conferences of the Executive Committee of the Manufacturers' Association.

Some of the concerns who are named as entering the combination have not been enthusiastic supporters of

associated effort, but even these have never opposed our organization.

The object of the National Hardware Association is to better trade conditions. This new company will probably have an earnest desire to see this object accomplished. It will be quite as essential for them to make a satisfactory showing to their stockholders as it has been necessary for the present managers of corporations as well as members of firms to show a profit in the conduct of individual businesses. In making this statement I have also in mind the fact that the stock in the proposed company will probably be held by Hardwaremen, and hence it will be very important that the company about to be floated should co-operate to the fullest extent with the jobbers throughout the country who are not stockholders in their company, but who are endeavoring to obtain a livelihood in the conduct of the same business.

You say that you notice a large number of names of members of the Hardware Association on the list of those who have given options.

This is true, and inasmuch as the National Hardware Association includes at the present time such a large percentage of the legitimate jobbers of the country it is impossible that any movement should have been inaugurated or any action taken by the Hardware trade of the country in which members of the National Hardware Association should not have taken an active part.

Personally I have felt it my duty to the association to be entirely neutral regarding this movement. I do not regret this course. Gentlemen who were prominent in promoting the enterprise are men for whom I have learned to have the greatest respect. I have learned to look upon the members of the National Hardware Association, as a whole, as my personal friends, and when a question arose on which I found a diversity of opinion among the members of the National Hardware Association I considered that my province was one of neutrality, and I am very much gratified to receive recent assurances of confidence from those who have entered into the combination, as well as from those who have not. While I remain as secretary-treasurer of the National Hardware Association no policy shall be executed which is not in the interest of the entire membership, but this statement is almost unnecessary, because during the seven years' existence of the association I have never known of a single instance where any officer or member of the Executive Committee has attempted to use the influence of the association for a selfish motive, and most certainly no effort will be made in the future in this direction.

There is an ever widening field for the National Hardware Association, and there is not the slightest probability of a lessening of our efforts as an organization to better general trade conditions.

Letters from Retail Merchants in Regard to Consolidation.

The following letters which have been received from retail Hardware merchants will indicate the way in which the consolidation of jobbing interests is regarded by them. The expressions thus obtained may be considered as representative of the opinion of this class of the trade, as they come from merchants of intelligence and position, who write frankly on the matter as it appears from their standpoint:

From a Prominent Official of the National Retail Hardware Dealers' Association:

When rumors of the Hardware combine began it did not occur to me that such a thing was possible. In a matter where local conditions are so much of a factor it does not seem that such an effort can prove a success, for the reason that manufacturers cannot afford to sell exclusively to such an organization. They will readily realize that if from any cause the combine declined to do business with them, they (the manufacturers) would be obliged to go out and rebuild their business with the independent jobbers. Personally, having faith in the in-

dependence of the American public, I think that wherever large combines become a menace to the business and industrial life of the people a means will be found to be rid of their baneful influence.

From the standpoint of a retailer, much will depend on the policy adopted by this corporation. If the policy is broad and liberal I can see benefit in a steadiness of the market, with reasonable prices prevailing, though I fail to see any prospect of cheaper prices for the retailer.

It is my opinion that the retail Hardware associations are in a good position to be controlled by the trend of the times, and they will carefully watch the developments of the future.

From a Well-known Wisconsin Merchant:

To so small a dealer as myself I cannot see that it will make much difference, but my experience with past consolidations does not lead me to believe that it will benefit any retailer to any extent whatever, but I do not suppose that is one of the objects to be gained. While they might reduce expenses, it would not militate to the benefit of the retailer or consumer. I do not see that the retailer will have any complaint coming, in advance, but shall be very much surprised if such a consolidation proves a success or a panacea for any of the ills they now think they are laboring under.

The time may come in the future when there will be but one jobbing concern, and but one retailing firm, distributing from one central point to the consumer. When it comes I would like a job in the office of *The Iron Age*, unless they, too, shall have previously gone into a combine.

Will Buy Outside if Possible:

We do not think anything about it. They will do as they please any way. We do not believe in combinations or trusts, and will always buy outside of them if we possibly can.

A Remedy Will be Found if the Combination Becomes Oppressive:

Consolidations seem to be the order of the day at present, so I do not know as we need be surprised at this one, which will merge the Hardware jobbing interests of the country. As I understand it, this scheme will include about two-thirds of the principal jobbing firms of the United States, but that it will leave several very strong firms on the outside. As a Hardware dealer I am not at all alarmed, for I am satisfied that this move will minimize expenses and should very materially lessen the cost of Hardware. I am also of the opinion that should this combination ever presume to take advantage of conditions they create, to the extent of asking exorbitant prices, that a remedy will be found to bring them to and "about face," even if the independent firms could not do so by competition.

There is no question but that the tendency to combine and consolidate is running riot in this country at this time. It seems to me, however, that matters will adjust themselves in the end, and when these trusts become topheavy of their own weight and magnitude, they will have to seek a lower and more equitable level.

I think that the expression of my views on this subject is shared in general by my fellow Hardwaremen in this section.

A Kentucky Merchant's Views:

There is a popular feeling against consolidations of capital because of the untold harm which can be caused thereby, and we, to a certain extent, share that feeling. Combinations formed to better trade conditions can do much good, but when their power is used to crush legitimate competitors who, on account of lack of capital, are unable to long remain in the struggle for trade, then such combinations should in no wise be supported by the public.

We are unable to see into the future, and cannot forecast how the Hardware consolidation will affect the re-

tail Hardware dealers. Taking the side of the consolidation we feel that there is some excuse for a consolidation of interests on the part of the jobbers. They themselves had trusts and combinations to deal with, and it is a well-known fact that their relations with one another were not always of a satisfactory character. In a great many instances they were under the thumbs of combinations and were compelled to do as they were bid regardless of consequences to themselves or their customers. We believe that it is the natural desire of every jobber to protect his customers, as their success adds to his own, and if the jobbers who have gone into this combination have in view with other reasons the bettering of the trade conditions of the retail Hardware dealers we see no reason to object to the consolidation.

Presenting a united front and representing an immense amount of capital it can set a pace which others are bound to follow. Its refusal to supply catalogue houses or department stores would have to be followed by independent jobbers with a like refusal. Therein we see the greatest benefit which could be derived by the retail Hardware dealers through this consolidation should they make such a refusal.

Our views as expressed may lead you to believe that we are in sympathy with the jobbers' consolidation, but that is not the case. Using a slang expression, we are on the fence and intend to stay there as long as it is to our interest to do so. If we find that the consolidation is detrimental to the interest of the retail Hardware dealers, then of course we will absolutely refuse to do business with it.

An Indiana Merchant is Satisfied if Due Regard is Paid to Retailers' Interests:

If it is in any way a help to the retailer by giving him better and more uniform prices it's all right. For many years I have been giving my largest trade to one jobber who has given me very good attention. I only fear in the hands of a trust the business will get into careless and indifferent hands.

From a Small Jobbing House in Virginia:

We do not believe the combination would be injurious to small jobbers, who, like ourselves, confine their efforts to contiguous territory that should naturally belong to them.

We can readily see how it may be possible for the combination to grow to such magnitude, and it should be to its advantage to do so, as to so control factory quotations to small jobbers as to practically exterminate them.

An Iowa House Have Yet to Find Any Benefit Resulting from Consolidations:

In our opinion it is not so much of a question with those who consolidate manufacturing or mercantile enterprises of how much can be saved in expenses, or what benefits may be derived in consolidated buying, &c., as it is, "How many dollars' worth of stock can we issue more than we put into the scheme?" One hundred and twenty millions of dollars is a large amount of money, and certainly will require a big pile of Hardware to represent it. Trusts, combinations or consolidations have been launched during fair weather and under a clear sky; how they will weather a storm remains yet to be seen.

From the standpoint of a retailer, we would rather not see them. So far we have yet to experience the first instance in which we found ourselves benefited by them. We do know, however, that we have paid some exorbitant prices for some lines of goods since the days of trusts and consolidation, and it is hard to educate the consumer to pay the big advances.

Control of Jobbing Hardware Business Indefinitely Not Likely:

It is somewhat early to form an opinion as to the disposition of the retail Hardware dealer in consequence of this consolidation.

I think there will naturally be some aversion against the firms in the consolidation, and that it will tend to give the outside people some advantages, of course provided they are in a position to meet the prices of the consolidation and can furnish goods as promptly as the consolidation can.

There will doubtless be less expense in the distribution of goods, and because of their purchasing large quantities they will doubtless be able to get the bottom prices on everything which they handle. However, it does not seem possible to me for any one to control the jobbing Hardware business for any length of time.

Views of an Aggressive Ohio Merchant:

The consolidation of large wholesale Hardware dealers is an economic move among themselves. The merger is a natural result of the close and keen competition that they have experienced from one another during recent years. Too many houses covering the same territory. The retailer is not likely to be concerned very much, as there will still be ample opportunity for him to buy his wants. In the present day of small stocks and large variety prompt shipment is a decided advantage, and the trust will have to keep in close touch to retain the business.

Regarding the smaller wholesale dealers who cover their local territory with a half dozen to a dozen salesmen, it would appear as though they would still be in a position to do a growing and profitable business. In plain words, the consolidation ought to be a good thing for the fellows who are in it, and still it would certainly appear as though there was plenty of room on the outside for the other fellows.

The Consolidation a Menace:

I do not look with favor upon the jobbers' consolidation. I believe it is a menace to the manufacturers, and it will be hard to convince the retailer that its ultimate motive is not to control prices. The retailer knows from experience with other so-called combinations that he has never been benefited in any way by their formation.

From a Tennessee House:

From a strictly retail standpoint believe it could result in much good. It should not be necessary for a retailer to do a wholesale business, as is now the case.

From a Large Indiana House:

As retailers of Hardware, who buy mostly direct from manufacturers, we are opposed to the consolidation of jobbers as well as manufacturers, when their main object is to sustain or advance present high prices.

A New Jersey Merchant Doubts its Success:

I have been in the Hardware business for a number of years, and it has always been my policy to run the business on my own plan, and not to be dictated to by combines of any sort. Seeing there are many manufacturers and jobbers who think the same way I cannot see how the consolidation will succeed.

Views of a Well-known Minnesota Merchant:

We are not in sympathy with the movement in any form. We are aware that mergers and trusts are much in vogue in these modern times, unpopular though they are. Some are successful, others are not. We cannot see wherein any benefits will accrue in this scheme, except it may be to the promoters, unless the manufacturers co-operate with the consolidation and refuse to sell jobbers that remain outside the trust. This we do not believe they will do; hence we cannot see that their path will altogether be strewn with roses.

From a retailer's standpoint we see no cause for alarm over the outlook. The retailer will continue to buy his goods as of yore, favoring the jobbers outside the trust, if on equal terms. In this history repeats itself. Combines formed for the purpose of controlling markets and prices are unpopular, and are looked upon

with suspicion, to be avoided, provided there is a way to do it. At the present writing it looks as if there are plenty of jobbers who do not care to be taken in by the octopus.

Inquisitiveness of a Connecticut House:

Concerning the jobbers' consolidation, we learn by *The Iron Age* that it is composed of 52 firms. Probably each firm have at least two members, making, at a very low estimate, 104 men who have been instrumental in making the individual firms successful. The consolidation is to be controlled by a board of 30 directors; this means that about 75 per cent. of the men who have been deeply interested in the success of the individual firms will assume the position of employees, or else be shelved entirely. Will the brains and enthusiasm of the 75 per cent. be condensed into the 25 per cent.? The capital stock is \$120,000,000. How much of this goes for dead stock and for good will, which cannot be delivered? Will not the economies which they hope to practice be more than counterbalanced by the increased expenses of consolidation?

After all, we find that our opinion, in regard to the success of the consolidation, is best expressed thus: ???

A Large Indiana Concern Question Feasibility:

We are not well enough posted to express an opinion regarding the consolidation of Hardware jobbers. Have always expressed doubt as to the feasibility of such a scheme, and have no reason as yet to change our views.

Not a Path of Roses, is the Opinion of a Rhode Island House:

From what information we have, and judging from our experience, it seems to us there are some very troublesome snags in the way that will likely cause annoyance, at least.

A Well-known Ohio Merchant's Views:

We are living in an age of centralization, combination and organization. Combinations (and trusts, if there be any) have not met public favor or approval on account of the immense amount of "water" in their make-up. But there is a bright side, as witness, the stability of prices at present, when the temptation is great to soar skyward.

The new jobbers' combine commands our admiration when we read the names of those who compose it. It looks like progress; it means advanced ideas, new methods; everybody awake. In these days of sharp competition an overplus of sympathy has been tendered the small manufacturer, the small jobber and also the retailer; but let all three put forth their best efforts; there is an abundance of room for those of us who are active and alert.

Of a truth "the times are changed and we are changed in them."

Rather be on the Outside than the Inside:

From what we can learn of the jobbers' consolidation we conclude that we would rather be on the outside than on the inside. We think it will work to the advantage of the smaller houses like our own; that it will bring about more steady prices and less active competition.

Good Thing for the Retailer, Say an Illinois House:

We believe it to be a good thing for the retailer, in that they can control the abuses that have entered into the trade, such as making special prices to catalogue houses, department stores and selling direct to consumers.

We believe that the jobber would, as a rule, prefer to sell to legitimate trade, but the standard of trade is measured by the meanest man in the business. What your competitors do you have to follow to a certain

extent. This, with less competition, will be bettered to a great extent. The consolidation will be leaders and the others will follow largely, and we think that the new company will be handled with good business sense and will therefore benefit the retailers in general. There is no fear of a monopoly; there will still be competition enough to keep prices reasonable.

A Large Pennsylvania House are Against Combinations:

From a retailer's standpoint we view the new jobbers' consolidation with fear to our interests. If only for one reason, they will be in position to go into the market and purchase the entire output of many manufacturers, and if the retailer wants that particular make of goods he will have to go to the jobber for it and pay what he asks for the goods. At the present time we are experiencing the same trouble with a line of Pocket Cutlery we have handled for years. We must buy it from the jobber or do without, consequently we are putting in an entirely new line. We had the same experience with the Shovel combination, and we have no doubt the recent 20 per cent. advance on Builders' Hardware came about by the consolidation. The middleman must take a back seat; all combinations are against his interests.

From a New York House:

Without knowing the aims of the jobbers' consolidation, we are opposed to it because, judging from the past, it will advance prices; that means less building, therefore less business and less profits.

Sorry are we of the 20 per cent. advance in Hardware. An advance in some lines was warranted, but not one to include all goods.

Will Watch the Consolidation's Policy:

We buy most of our goods of the makers and therefore only buy of the jobbers pick up orders, and our experience has been that we could most always do better on our "pick ups" with the small jobbers than with the large ones. However, it seems to me that no one can form an intelligent opinion until they know what the manufacturers are going to do with this colossal concern. If the manufacturers are going to protect this concern on the same lines that the United States Steel Corporation do the large jobbers on iron and steel by stipulating that unless a certain quantity of a size is ordered and taken an extra price is charged, you can see at once the consolidation would be placed in an advantageous position over the other jobbers. Therefore I believe we have got to wait and see what the policy of the consolidation is going to be in doing their business, also the policy of the manufacturers in doing business with them, before we can map out any policy to be pursued, but we must be ready to adapt our methods to meet the conditions as they arise.

A Connecticut Merchant Does Not Fear the Consolidation:

We do not feel competent to criticise the action of such men as Mr. Simmons, Mr. Bindley, Mr. Bigelow and the many other leaders in the Hardware trade who are associated together in the new consolidation. We know nothing of it except as we have read about it in the daily papers and *The Iron Age*. So far we can see nothing in it to interest any one outside of the new company, except possibly the people who may buy the common stock. One hundred and twenty millions is a big sum, and the \$80,000,000 common stock will be a good profit if they are able to float it.

So far as the effect on the manufacturer and retailer is concerned, they have always been able to take good care of themselves, and if they continue on and attend to their business, can see no reason to fear the new concern. They will find very few manufacturers who will place their product wholly in their hands, and as there are several lively jobbers left out, think the re-

tailer will have no trouble to get all of the goods he needs, and a great many dealers will give the small jobber preference. On the whole it looks to us that the whole matter is an addition to the Simmons Hardware Company. They dominate the concern and their policy will run it. Several of the jobbers whose names are in are glad to sell out and take their preferred stock. "Those houses that do not pay will be closed up," so that the best of the lot will continue, and Simmons Hardware Company's field is so much larger. We hope the scheme will succeed financially, as it would be very bad to have so many "closed up." It is an entirely new departure and time only will show if it is a wise move or not. We do not think it will affect us or our business in any way. This conclusion may be wrong, but we cannot see anything to fear; neither can we see any advantage to us. The people in it are the only ones to be benefited, or to lose if loss it proves to be.

The Project Not a Practicable One:

We hesitate at offering an opinion on the proposed jobbers' consolidation until we are better informed as to their plans. Unless they have other plans for conducting the organization further than has been presented in your journal, the scheme does not look at all practical to us.

We believe that they plan to cover too large a territory. The wants and methods of doing business of the retail dealers are so diversified throughout this large country that we do not believe it possible to supply to advantage through one distributing medium.

We await with considerable interest further details, which we presume will be presented to the public when they are ready to market their securities.

How a Large New York House Look at the Matter:

We hardly feel qualified to express an opinion in regard to the jobbers' consolidation. As we see it now it certainly is a large undertaking, and it looks as though it would require considerable work to perfect the same.

The small retailers certainly will be placed in worse shape than they are now, as they will see less traveling men and have less chance to keep posted and buy goods. We ourselves have no sympathy whatever with trusts and combinations. They propose to reduce expenses, making all their extra profit in that way. As soon as they get organized advance will commence. At least that has been our experience.

We think the larger retailers and smaller jobbers will be benefited by this consolidation after a short time, as the manufacturers will be obliged to look to them for help to distribute their goods, as the consolidation cannot control them all as well as the jobbers have heretofore. We feel very much as if there would be a drop somewhere before a very great while on trusts and consolidations, as water must seek its level.

An Optimistic View of the Great Consolidation:

I have thought frequently of the proposition since it was first mentioned several months ago, and am frank to say that it has not at any time created any fearful apprehensions in my mind. In fact, I approve it, as far as its effect upon the retailer is concerned, and that is the only phase of the matter I shall express an opinion upon, as all other relations of the consolidation are necessarily and properly of interest only to those who are interested in some particular branch that affects them. I do not conceive that the gentlemen in control of the enterprise contemplate any high handed or arbitrary method of fixing prices. I can only conceive that the same broad minded, liberal and business-like conduct that has characterized them in the past will continue and will characterize the conduct of the merged interests. I can conceive that their greatest success, aye, their only success, will be in conducting the enterprise upon a broad minded, high principled, conservative and reasonable basis, catering to the legiti-

mate Hardware trade, exercising their vast power in the better distribution of goods and in steadying prices of commodities that have heretofore fluctuated unduly by reason of senseless competition or speculation.

We have two facts: 1. The jobber is an absolute necessity to the retail Hardware dealer. That is obvious, and no use to argue or enlarge upon it. 2. The larger the jobbing house and the greater its variety of stock and facilities for distribution of its stock, the greater is its benefit to the retailer. In this fact are many advantages for the retailer. Briefly and chiefly may be mentioned the standardizing of brands, sizes, styles and weights of goods, the improvement of quality, the reduction of freight costs by reason of nearby distributing points, unlimited variety of stock to select from, thus saving time and freight in getting goods, and uniform quality and price, which, to my mind, are items of great importance to the retailer. If we have uniform quality and steady prices it will go a long way toward correcting the senseless competition between retailers. And right here I would reiterate an oft expressed conviction that it's not our relations with jobbers that are troubling us so much as our relations with our retail competitors; and of this I would say more, that is not proper in connection with the subject under discussion. However, the National Hardware & Metal Company are an established fact; whether for good or for bad effect upon us as retailers time only will tell. I am an optimist. I believe it will exert a salutary effect upon us as a whole; hence I say God speed to the latest and greatest mercantile house in the world!

Retailer will be Benefited:

Undoubtedly the jobbers' consolidation will be a good thing for the retailer if properly managed. There is the danger of their being arbitrary and forcing up prices, with a chance of holding up our orders, in case we divide them with outside jobbers. There are many advantages we could get from them. They should be able to sell us at lower prices and should drive out the irresponsible dealers who are willing to sell at any price, if they can get the goods. On the whole, I believe the retailer will be benefited.

Manufacturer and Retailer will be Brought into Closer Communion:

With our limited knowledge of the scope of this consolidation, we do not feel that we are in a position to give an intelligent opinion. The subject is too vast for our comprehension at this writing. We should say, however, off hand, that it looks to us as though this movement would bring the manufacturer and the retailer into much closer relations. We are inclined to think that the manufacturer will look with considerable suspicion upon this consolidation. In common with others we shall watch the experiment with a good deal of interest.

A New Hampshire Merchant's Brief Comment:

It does not seem to us that it will prove a success.

Expression from a Wholesale and Retail House in Pennsylvania:

In the abstract, I think the consolidation of Hardware jobbers will benefit the trade—both jobber and retailer. Under wise management a better maintenance of prices will prevail, many irregularities will cease, and I believe the Hardware trade will be better controlled and kept in the proper distributing channels. From the standpoint of retailer and jobber I cannot foresee anything but better conditions. I hope it may be a success.

More Interested in the Attitude of the Manufacturers:

We are interested more in knowing what attitude the prominent manufacturers will take toward the consolidation and smaller jobbers relatively. The smaller dealers can sell goods in their territory, other things being equal.

View of a Florida House:

The consolidation of the large jobbing Hardware houses of the country will be watched with close interest by the retailer and small jobber. If the consolidation carries out all its promises it would seem that perfection in trade would be reached. The experience, however, with some buyers of consolidations has not been favorable. The promptness promised has not materialized, and a less liberal spirit shown than when each house of the consolidation was under individual control. Old established houses certainly do lose their individuality and there is a consequent loss of patronage. This has been shown in the recent consolidations of Wire and Stamped Ware interests. The consolidation may be satisfied with the results, but many orders have gone direct to smaller jobbing houses or manufacturers. It is hard to predict just what the result of the present consolidation will be. The small jobber and retail buyer will doubtless give the new company a fair trial and if prompt service and proper prices are received he will no doubt remain a permanent customer.

From a Long Established and Successful House in Pennsylvania:

The success of the consolidation of Hardware jobbers will be largely dependent upon what position manufacturers take toward the new organization. One of the prime incentives leading to this combination undoubtedly was the desire to place the large jobbing interests in a position to make more advantageous terms with the manufacturers than was possible individually. If, as seems likely, the manufacturers will consider it better to cultivate closer relations with the small jobbers and the large retailers, the success of the movement is decidedly questionable.

The growing distrust with which the public in general is beginning to look upon large combinations of this kind will also be a hindrance to the success of this venture. On the whole we think it a good thing for the fellow on the outside.

Much Depends on the Management of the Company:

It is a bold man who will attempt to say anything original concerning it. This combination is so entirely unlike any one that has yet been made that it will take time to decide as to its wisdom, but I think it is safe to predict that 75 per cent. of its success will depend upon its management; the other 25 per cent. upon the attitude of the retail trade toward it. There is a growing disposition on the part of manufacturers to increase the number of their customers, selling the same volume of goods, rather than to decrease the number, on the principle that it is not wise to have too many eggs in one basket.

From a Well-known Missouri Merchant:

The matter of the consolidation is almost too fresh to enable one to give an opinion of much value. However, I believe this consolidation leads to and necessitates others, such as manufacturers, &c. I am of the opinion that out of it all will come nothing but good to the retail trade. They are the natural avenue for the distribution of the goods to the consumer, and I do not believe that they will be ignored in any sense. The consolidation can tend to check and obliterate many evils that we complain of, and I believe they will do it. The combined capital of the retailer in Hardware is immeasurably greater than that of the jobber and consolidation along all lines is a possibility (in case of necessity for self preservation). I am optimistic and hope for the very best.

What a Large Mississippi Concern Think:

If the members of the Hardware consolidation are satisfied with the arrangement, jobbers on the outside should certainly have no objection, inasmuch as the con-

solidation can hardly do themselves good without benefiting other jobbers as far as establishing selling prices is concerned, and the growing feeling among people against consolidations and trusts will have a tendency to throw more trade into the hands of the jobbers on the outside.

DEATH OF CYRUS B. MARTIN.

CYRUS B. MARTIN died at his home in Norwich, N. Y., Wednesday, April 2, of congestion of the brain after an illness of less than a week.

Mr. Martin was born in Argyle, N. Y., September 6, 1830. He was educated in the public schools and the academy of his town, and in 1845, at the age of 15, entered the office of the Glens Falls, N. Y., *Clarion* to learn the printer's trade. After a four years' apprenticeship he went to Albany, where from 1850 to 1855 he was a compositor on Thurlow Weed's paper, the *Albany Evening Journal*. In the latter year he went to Norwich and became a partner with George C. Rice as proprietor of the *Chenango Telegraph*. In 1861 he went to Newburgh, N. Y., where he purchased the *Highland Chieftain*,



CYRUS B. MARTIN.

the name of which he changed to the *Newburgh Journal*, and remained in that city as editor and proprietor of that paper until 1877, when he removed to Norwich, N. Y.

During Mr. Martin's former residence in Norwich he was married in 1858 to the daughter of the late David Maydole. Four of their children, one son and three daughters, reached maturity, the son, Charles M. Martin, dying in 1899 at the age of 27 years, which proved a crushing blow to his father.

On Mr. Martin's return to Norwich in 1877 he entered the firm of David Maydole & Co., manufacturers of Hammers, with which business concern he has since been actively identified. The business was incorporated as a stock company in 1890, under the name of the David Maydole Hammer Company, the late Charles H. Merritt being its first president. Upon the death of Mr. Merritt, in 1890, Mr. Martin succeeded to the presidency, which position he had since held. He had also been a director of the Chenango National Bank and the president of the board of directors since its organization in 1883. He was treasurer of the Norwich Water Works Company, in which he was a large stockholder, and was a director of the Norwich Building Company, which caused to be erected the buildings occupied by the Nor-

wich Silk Mill. He was also a director of the Norwich Furniture Company.

In the progress of the public schools he took a keen interest, and in the improvement of the village streets and public buildings his support was always to be relied upon. He was much interested in the establishment of the Chenango Valley Home for Aged People. Through his generous gift of the lands upon which the substantial building was erected some three years ago, accompanied with a liberal sum of money as a beginning for a building fund, the permanent success of the institution was assured.

In his support of church and religious societies, Mr. Martin was a quiet, though generous giver, and although a trustee of the First Congregational Church for many years, and a regular attendant, he did not restrict his support to the one society alone, but gave liberally to the other churches of the community. No worthy object or person appealed to him in vain for help. Yet he was quick and firm in his opposition of those that he believed to be unworthy. His integrity and strength of character were well known and unquestioned. He was held in high esteem by all and in very warm regard by his many friends. He will be greatly missed on account of his personal worth and as the head of the famous house with whom he was identified.

READING HARDWARE COMPANY.

THE annual meeting of the stockholders of the Reading Hardware Company, Reading, Pa., was held at the office of the company on the 7th inst., when the following Board of Directors and officers were elected: Directors, M. Harbster, Wm. M. Griscom, John G. Mohn, J. E. Harbster, Jacob C. Fricker, H. C. England, Isaac G. Treat. Officers, M. Harbster, president; Wm. M. Griscom, vice-president; John E. Harbster, secretary; G. Nicholas Jacobi, treasurer; S. Y. Reigner, assistant treasurer; F. L. Stellwagen, manager sales department.

The salesmen of the Reading Hardware Company, New York branch, which has been under the management of Frederick L. Stellwagen for ten years (formerly with Sargent & Co. for 14 years), decided on learning of their manager's elevation to the office of general sales manager of the company to give him a dinner, as evidence of their appreciation of him as their manager during the past decade. Although they had but 36 hours' notice of the change, which was to become effective on the 14th inst., the dinner was arranged for at the Hardware Club for Friday night, April 11. In the meantime, wishing to give him a visible memento of their regard, they selected a handsome gold watch charm locket, in the center of one side of which was a good sized diamond. The inside was suitably engraved, and on reverse outside was his initialed monogram. G. N. Jacobi of the Reading office, who is the new treasurer and is succeeded by Mr. Stellwagen, happening to be in New York at the time, was a guest of the occasion. Those present of the salesmen were H. A. Fisher, Frank Kelly, George Ogden, W. Van Kuren, A. Williams, W. Randall, F. Weeks, V. A. Clayton and A. Miller, together with C. A. Packard, who will succeed Mr. Stellwagen as manager in New York. Mr. Stellwagen's new duties will compel him to make his headquarters in Reading, he having supervision of the entire traveling force, including the New York, Philadelphia and Chicago branches. Mr. Packard, who is now in charge of the New York office, has been with the Reading Hardware Company for two years and was originally with E. O. Noyes, Brockton, Mass., but prior to his connection with the Reading Company was senior partner in the firm of Packard & Evans Company, Boston, Mass., dealers in general hardware.

THE OSBORN MFG. COMPANY.

THE OSBORN MFG. COMPANY, Cleveland, Ohio, have just issued a new catalogue, No. 90, covering Steel Wire, Bristle and Fiber Brushes and Brooms, Foundry Supplies and Hardware Specialties. It contains more than 100 pages, most of which are devoted to the very extensive line of Brushes and Brooms which they manufacture.

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DEATH OF J. H. SESSIONS.

JOHN HENRY SESSIONS, one of the leading manufacturers of Bristol, Conn., the head of J. H. Sessions & Son, died at his home in Bristol, April 2. March 31 he had an attack of heart failure, and his right side became paralyzed so that he was unable to talk. He went to Cleveland last Thanksgiving and was taken sick soon after his return. He gradually improved after this attack and made a practice of going to the office each day until February 10.

John Henry Sessions was the eldest son of the late John Humphrey Sessions, and was born in Polkville, now Edgewood, near Bristol, on February 26, 1849. He attended the schools of the town. The elder Sessions had already laid the foundation of the successful business enterprises which have made the name famous, and when the son was quite young he entered his father's office on North Main street, where he learned the business in a practical manner. The concern had then begun to practically control the market in certain lines of



JOHN HENRY SESSIONS.

trunk Hardware and a big business was being built up. In 1873 Mr. Sessions was admitted to partnership with his father and the firm has for nearly a generation been known as J. H. Sessions & Son. It has been one of the most prosperous manufacturing concerns in Bristol, and is well known all over the country. Upon the death of the elder Sessions in 1899 the business fell to J. H. Sessions, and since that time Mr. Sessions had taken into partnership his only son, Albert Leslie Sessions, who has had charge of the plant during the long illness of his father. For a number of years Mr. Sessions was a traveling representative of the concern, and on account of his amiable disposition, hearty, whole souled manner, he was one of the most popular men among the commercial travelers. For the past 20 years he had given close attention to business. Mr. Sessions had been connected with the Bristol Water Company since their organization, was for many years a member of the Board of Directors, and upon the death of his father was chosen president. He was also a director and vice-president of the Bristol National Bank. Upon the reorganization of the E. N. Welch Clock Mfg. Company of Forestville in 1897 Mr. Sessions was chosen one of the directors. He was also one of the original incorporators of the Bristol Press Publishing Company and was a director until a year ago. In 1881 he was appointed a member of the Board of Fire Commissioners and had since remained on the board, since 1883 as its secretary. He was a member of the Prospect Methodist Church and had during his life been a good friend to the church. When his father

erected the handsome church edifice on Summer street, which is really his monument in Bristol, Mr. Sessions contributed liberally toward its furnishings. Mr. Sessions was exceedingly liberal and kind hearted, and found great pleasure in making other people happy. Whenever he knew of any one in distress or in need of financial assistance he often went to their relief in a modest, effectual manner, that was seldom heard of except by the parties directly interested. One of the last acts of his life was to render substantial assistance to a veteran of the Civil War, to whom Mr. Sessions was practically a stranger, but of whose needy condition he had chanced to hear. For years past he had sent coal, household supplies and money to people about the town that the public knew nothing about. Possessed of wealth he used it largely to make others who were less fortunate more comfortable and happy.

Mr. Sessions' tastes were simple, he lived plainly and always took a great interest in outdoor sports.

Mr. Sessions married May 19, 1869, Miss Maria Francena Woodford, who survives him. They have one son, Albert L. Sessions, who succeeds his father at the head of the big manufacturing plant. He was graduated from the Sheffield Scientific School in the class of 1892.

EXPANDING THE HARDWARE FIELD.

THE scope of the modern wholesale business in Hardware and related lines has broadened greatly within a comparatively few years, as is unmistakably indicated by the classes of manufactured merchandise now catalogued and sold largely which were entirely foreign to the Hardwareman's stock a few years ago. A glance at either the complete catalogue or one of many subsidiary catalogues issued by the leading Hardware jobbers from Boston to San Francisco and Duluth to New Orleans gives a good idea of this significant trade expansion, which is keeping pace with the growth of the country's population and wealth. Two recent examples of this development of new lines are afforded by two well-known St. Louis houses. The Simmons Hardware Company, in catalogues Nos. 413 and 420, solicit business for comprehensive lines of Baby Carriages, Freezers, Refrigerators, Reed Furniture, Chairs, Tables Willow Ware, Iron and Brass Beds and Springs, boys' Wagons, Velocipedes, Tricycles, &c., as shown in a book of 268 large pages, No. 413, while catalogue No. 420, a book of 305 pages, calls attention to Fishing Tackle, Golf, Tennis and Baseball Goods, Hammocks, Tents, &c. Many of the above lines, it will be observed, were not considered legitimate Hardware a few years ago. Another St. Louis house, the Norvell-Shapleigh Hardware Company, have just issued in advance of a large general catalogue in course of preparation a book of 183 pages devoted to Guns, Ammunition, Fishing Tackle, Sporting Goods, Tents and other analogous goods.

L. S. STARRETT COMPANY'S NEW QUARTERS.

L. S. STARRETT COMPANY, Athol, Mass., manufacturers of fine Mechanics' Tools, have by the growth of their business been compelled to secure larger quarters and greatly increased accommodations for their New York branch house in charge of A. H. Briggs, formerly at 126 Liberty street. They have just moved into that portion of the building on the northeast corner of Liberty and Greenwich streets, diagonally opposite from where they have been, formerly occupied by the Pratt & Whitney Company, at 123 Liberty street, where they have the street floor and basement, each 30 x 60 feet. This enables them to carry a much larger stock, and gives them much better facilities for transacting business.

Brownell Bros. have purchased the Hardware business of the E. E. Stewart Company, Hailey, Idaho, wholesale and retail Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c. The new proprietors will soon incorporate as Brownell Bros. Company, with a paid in capital stock of \$25,000.

HOW TO WRITE AN ADVERTISEMENT.*

A PROFESSIONAL ad. writer wrote recently: "I can't tell you in writing how to write an ad., but if you will come to my office, I'll show you." So you will pardon me if I drop the writing and attempt to show you how the trick is done. However, I can say some things to direct your thoughts along the lines I purpose illustrating.

I shan't stop to give credit to my authorities. We all profit by what we see, and I have gleaned everywhere. In turn, let me suggest to you, don't hesitate using whatever you see, for in advertising it is generally understood that anything you can learn from another and adapt to your own peculiar needs is essentially original with you. Probably the imitations of the mocking bird who tries to sing an improvement on every song he hears, as compared with the originality of the crows' songs, is about the simile to use. Of course, I don't decry originality, but following is safer.

Now, in relation to your business. What are your ads.? You are in business to make money. To do this



M. DE MOTTE.

you have to buy goods, have to sell goods, and the latter is your chief end.

Your reputation for fairness and square dealing helps you in this!

Your friendship and position in the community help!

Your clerks are important assistants!

Your store and stock, and the way your goods are displayed aid you!

Your store windows sell goods by their attractiveness, or hinder your sales by their opposite, due to neglect!

These are simply some of the ways of selling goods.

NEWSPAPER ADVERTISING.

Here comes another way, your newspaper advertising. Though it is not the least, I put it last. You can have the finest of newspaper ads. and have their effect entirely dissipated by your store keeping, lack of attention on the part of your clerks, poor goods, lack of consistency on your part, or any other item of bad business management. While many a business has been successful to a degree in newspaper reading communities without a line of newspaper publicity, it had back of it all the other elements of success. They used to say that "Honesty is the best policy." That was years ago. Nowadays honesty is the only policy, and a man's ads., unless the honest representative of an honest business, had better be unpublished, for they will react with the deadly effect of a boomerang. But a good ad. is a good salesman for a good master.

And, conversely, an ad. that sells well is a good one. So let us look into its character.

*Paper read by M. De Motte of St. Paul at the recent annual meeting of the Minnesota Retail Hardware Association.

AD. CHARACTER.

1. It's your ad. I have in mind a man who has been successful in advertising his business, but whose ads. are as ungrammatical as his everyday speech. You see, they are his ads. If they were couched in the king's best English they wouldn't be. I am rather of the opinion that if you are in the habit of using in your conversation such an expression as "We ain't got much, but what we got's good," you would better use that in your ad. than to allow some one to put the unnatural, though more elegant expression, "What we lack in quantity we make up in the supreme excellence of our quality." Oh, yes, it's better to be grammatical, but don't send out from the printing office an ad. that wouldn't feel at home if it should stray into your store. Let me suggest here the great weakness of men unused to the pen or pencil. Too many men have a clogging up of their mental machinery the minute they get their cramped fingers on a pencil and write as they never speak. That's poor stuff to put into an ad. Your ad. should be you spread out on paper. Practice writing as you talk until you have the ability, if you don't possess it now. That's the only way, and such ads. are the only successful ones. If some men talked the way they write they would be sent to a place where the State takes care of people not possessed of all their faculties. The first thing, then, is that it's your ad., and should represent you.

TO THE POINT.

2. Of course, it should be brief and to the point. Now too brief, either. Say enough to clearly convey your meaning; don't presume that people will understand, for they won't, and it will be too late in your next ad. You won't feel the need of lengthy editorials; some department stores use them, but you won't need to; just talk familiarly about your goods and their prices.

LEADERS.

3. Have a leading feature or a leading subject for each ad. Have something about your ad. and its display that will immediately attract the eye from the other parts of a page; make a study of these leaders, for they will make the success of your ads. That's the way to sell goods. You know how it is. A drummer comes into your store and says: "Good morning, do you want anything in my line to-day?" And on general principles you say, "No." He's dead easy and goes away empty. Another comes in, and with tact, interests you immediately in some one thing and directly has your order for other things also, don't he? That's a leader. You do the same thing when you wait on a customer, don't you? Just do that in your ads., too.

SMALL ADS.

4. In small ads., don't attempt too many different items, but if you desire you can group around your leader several other kindred things which you may wish to advertise. I know that this suggestion seems to be contrary to the advice you will get from many professional writers on this subject, for they all say, "advertise one thing only." Well, most of their talk is on magazine advertising, while what I have said is applicable to small newspaper ads., either daily or weekly, and these recommendations are from practical experience in writing small pulling advertisements. I know you can do as suggested and meet with success, so I say again, in small ads., you can group around your leader several other kindred things. For instance, when you advertise a Cook Stove, speak of kitchen tools and cooking utensils; a Heating Stove, Stove Boards, Ash Sifters, Coal Hods, Shovels, &c.; Wagons, with Harness, Whips, &c.; Garden Seeds, Garden Tools, Wheelbarrows and such things. Do you get the idea? Later on, I will show you a way by which you can bring in items entirely irrelevant to the general subject of your small ad. In larger ads. you can work in variety enough. A good way to build a large ad. is simply to make it up of a lot of small ones.

OFTEN.

5. Often! That's one of the passwords to successful newspaper advertising. Often in newspaper advertising doesn't mean the same ad. repeated; that's not to be considered newspaper advertising, that's nothing but a

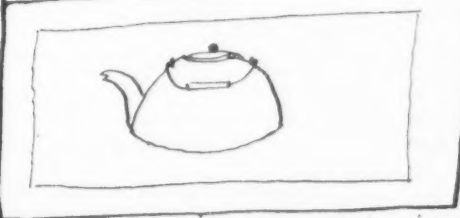
1 Col. wide

6 pt black rule border

24 pt Draw

4 pt border box

Granite - Ware to Wear



There are all kinds of Granite ware. Some hardly worth throwing away. You will find in this, as in every thing else, that what we consider worth selling will prove well worth your buying.

Special Sale of Granite

Handsome mottled blue outside and pure snow white inside on heavy steel shells. Made for service. Made to wear.

Tea Kettles: we have three sizes in either flat or pit bottoms:

No. 7	No. 8	No. 9
85	1.00	1.15

Rice Boilers: seamless outside kettle as well as inside cup. Will last a lifetime.

1 qt	1 1/2 qt	2 qt	2 1/2 qt	3 qt
65¢	75¢	85¢	1.00	1.20

Pudding Pans: deep ones, too.

1 qt	2 qt	3 qt	4 qt	5 qt
15¢	18¢	21¢	25¢	36¢

A woman can't make good coffee in a poor old coffee pot. nor is it worth her time trying to keep the old thing clean. Now's the time to throw it away.

Now's the time to throw it away.

Special Prices

Tea & Coffee Pots Cheap.

These prices mean fine granite at the price of cheap pot stuff.

Pots worth 50¢	Special only	39¢
Pots worth 60¢	Special only	49¢
Pots worth 70¢	Special only	58¢
Pots worth 80¢	Special only	68¢
Pots worth 90¢	Special only	77¢
Pots worth 1.00	Special only	87¢

These prices are for the three days only & for cash.

Our store is full of good kitchen things at very reasonable prices.

John Smith & Co

Mendota's best hardware store

By the way, you will do some painting this spring. We want to have a chance to tell you something about our line of paints. We can save you money by giving you the best results.

18 pt D

10 pt D

8 pt D

8 pt Body

Thursday, Friday & Saturday we sell

Indiana best sides best matter in middle of Col.

There is 8 pt D prices in 18, and

Granite ware to wear



There are all kinds of Granite ware. Some hardly worth throwing away. You will find in this, as in everything else, that what we consider worth selling will prove well worth your buying.

Special Sale of Granite

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Pudding Pans: deep ones, too.

1 qt.	2 qt.	3 qt.	4 qt.	5 qt.
15¢	18¢	21¢	25¢	36¢

A woman can't make good coffee in a poor old coffee pot, nor is it worth her time trying to keep the old thing clean. Now's the time to throw it away.

SPECIAL PRICES

Thursday, Friday and Saturday we sell

Tea and Coffee Pots Cheap.

These prices mean fine granite at the price of poor stuff.

Pots worth 50c.	Special only	39¢
Pots worth 60c.	Special only	49¢
Pots worth 70c.	Special only	58¢
Pots worth 80c.	Special only	68¢
Pots worth 90c.	Special only	77¢
Pots worth 1.00	Special only	87¢

These prices are for the three days only and for cash.

Our store is full of good kitchen things at very reasonable prices.

JOHN SMITH & CO., Mendota's Best Hardware Store.

By the way. You will do some painting this spring. We want to have a chance to tell you something about our — line of paints. We can save you money by giving you the best of results.

sign. What do you use, a weekly paper? Have a new, smart ad. every week. Do you use a daily? The best would be to have a new ad. every day; but you might think that quite a task. Then better go in three times a week with a new ad. every time, and really that isn't much, if you will practice to be perfectly natural.

TYPE.

6. Don't use, and don't let the printer use, more than two kinds of type in your ads. One style for the descriptive body of the ad., say the same as he uses for the body of his paper; and another for the display lines, and this he should have in several sizes. It is very important that this display type should be clear and easily read. It isn't considered good to use too many large display lines. You know how it is; if you shout to catch attention you don't continue shouting, or you will lose it, and that's doubly so in advertising.

BORDERS.

In this connection let me speak of borders also; they play a big part in the attractiveness of a small ad. It will pay you to watch the ads. in magazines for catchy make-ups with borders. You will find that most of these small ads. have the signature at the bottom, and your experience will teach you that it will give you a better opportunity to work a startling opening thus arranged than if you put your name first.

PERFECTLY NATURAL.

If I were to sum up the points I have made, the one I should emphasize most is that of being perfectly natural and conversational in your advertising style. You remember old Polonius advised: "To thine own self be true," and this is splendid advice to the ad. writer. Add the result given by the same authority: "And it shall follow, as the night the day," that you will have pulling, persuading advertisements.

CHALK TALK.

Mr. De Motte then began his illustration of how to write an ad. in a "chalk talk," emphasizing each of the suggestions made in his outlines and adding many minor points. Following is his description of the Granite Ware advertisement illustrated herewith, the copy as prepared for the printer being shown, together with the advertisement as set up from the instructions thus given.

Suppose when you go home you should try to work out an ad. such as we have just outlined; say you decide that it should be on Granite Ware. Your only cut happens to be one of an old Granite Tea Kettle. Well, that will do, though it might be better to have several cuts in such an ad., but don't let that stop you, your customers won't know the difference, and you can do it another way next time.

1. It's your ad.; this will have to be mine.
2. To the point, and brief.
3. We'll make a leader of the opening words, the cut and the border. Sometimes a cut alone will do this.
4. We have only kitchen stuff in this ad., but we mention something else, as I said I would show you.
5. Often. Such an ad. is really intended for but once.
6. You'll see what I mean about type.

SUGGESTIONS.

Now that's about the way I should talk and about the way I should emphasize my talking. Sometimes I'd put the bargain feature in first, but, as a rule, it's a good plan to hold your biggest thing back.

I consider such an ad. sufficiently brief; it could be cut down quite a little, but a skeleton is not so attractive as the full figure.

Do you think such an ad. would be lost on a page? Try it once and you will find that it can't; it stands out distinctly.

We have only one line; we could have made the special price feature of some other kindred line just as well, though I think it is all right to do just as we have. Then do you get my way of running irrelevant matter at the bottom of the ad.? You can ring the changes on this. Call it a P. S., or put in "That Reminds Us," or "There, we forgot to speak of —," or some other very natural expression.

Such an ad. is spoilt if run twice; it's a story, not a sign. The better the ad., the less fit is it for repetition.

AVOID CAP WORDS.

You can readily see what I mean in the use of type; the display type used here is called Drew. It's a good, attractive black face, and found in most printing offices. De Vinne is good, perhaps the best, and everybody has it. Gothic is good, but rather commonplace. Don't let the printer run in anything like fancy type. You will notice I have avoided words in all capital letters. In your reading almost all of the letters you see are small ones; from habit people read them best. This seems like a small point, but you will find it to your advantage to avoid all cap words.

Other advertisements were composed and discussed in much the same vein.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

James H. McGuire and S. A. Lyke have formed a partnership at Johnstown, N. Y., and will commence business about May 1 under the style of McGuire & Lyke. The members of the new firm have heretofore been connected with the establishment of Frank Miller of Johnstown, the former for a period of 15 years, and the latter for five years. Their line will comprise General Hardware, Agricultural Implements, Sporting Goods and Iron and Steel. The new concern will be pleased to receive catalogues and price-lists relating to the above lines.

Amherst Hardware Company have recently opened up in business at Amherst, Va. The officers of the company are the following: F. T. Harris, president; W. T. Ware, vice-president, and B. T. Drummond, secretary and treasurer. The company deal in Hardware, Heavy and Shelf, Agricultural Implements, Stoves, Tinware and furniture, and will appreciate copies of catalogues, price-lists, &c.

Warfield-Pratt-Howell Company, wholesale grocers, operating three establishments in Iowa, have recently added a wholesale department in House Furnishing Goods, Hardware Specialties and Wooden Ware Specialties, with headquarters at Des Moines. They desire catalogues and price-lists pertaining to these lines.

The Farmers' Hardware Company, Saratoga Springs, N. Y., are just starting in business as dealers in General Hardware, Farming Implements, Stoves, Tinware, Paints, Glass, &c., and would be glad to receive catalogues and price-lists.

The Hughson & Allen Mercantile Company advise us that they have frequent requests from their branch house in Australia and from their Oriental correspondents for catalogues, price-lists and information concerning new lines and specialties. The company refer to their facilities for handling export trade and for securing the introduction of new goods into the Eastern and Australian markets. The Australian manager of the company is at present visiting this country, and is prepared to make comprehensive arrangements with manufacturers of suitable goods who may desire to have their products introduced in that field. His present address is at the Pacific Coast office of the company, 105 Front street, San Francisco.

Louisiana & Arkansas Railroad, through their purchasing agent, J. A. Buchanan, Stamps, Ark., desire copies of catalogues and price-lists relating to Plumbing Goods.

Geo. H. Taylor, dealer in Shelf Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, and also Plumbing, Heating, &c., Wakefield, Mass., desires catalogues and other printed matter relating to these lines.

The Camp Engineering Company, 47 Lake street, Chicago, request catalogues of Gas and Gasoline Engines.

C. S. Hughes & Co., Downer's Grove, Ill., have recently sold out their retail Hardware business, and have embarked in the jobbing and manufacturers' agency field. They are soliciting the retail Hardware trade in Illinois, Wisconsin and Indiana and the jobbing trade in the larger cities. Their line comprises Cutlery, Edge Tools and a number of Hardware Specialties, including Pliers, Nippers, Glass Cutters, Nail Pullers, &c. The new firm will be pleased to hear from manufacturers desirous of representation in their territory, and to receive catalogues, quotations, &c.

PRICE-LISTS, CIRCULARS, &c.

C. O. JELLIFF & Co., Southport, Conn.: Catalogue C, illustrating the line of Wire Goods, Wire Cloth, Wire Work and Agricultural Implements manufactured by them.

J. D. SMITH FOUNDRY SUPPLY COMPANY, Cincinnati, Ohio: Complete catalogue and price-list No. 10 of their business as manufacturers of all kinds of Foundry Facings and Blackings, importers and refiners of Plumbago, Silver and Black Lead and manufacturers of and dealers in supplies for iron and brass foundries, pattern makers, machinists, rolling mills, &c. Since issuing their No. 9 catalogue they state that they have added a number of good things to their line. They also refer to their capacity as enabling them to meet the demands of the trade efficiently and promptly.

THE BARNES MFG. COMPANY, Mansfield, Ohio: Paper covered pocket edition Pump Catalogue C, which is an exact duplicate of their large Catalogue C, and which is issued for the convenience of their Pump customers, who may desire to carry such a catalogue in the pocket. It will be cheerfully sent to any dealer on application.

PAXTON HARDWARE MFG. COMPANY, Paxton, Ill.: Catalogue and price-list of Kitchen and House Furnishing Hardware, comprising Paxton Roaster and Baker, Prairie State Roaster and Baker, Lebanon Cake Cutter, Magnet Broom Holder, Lebanon Broiler, Combination Holder, Egg Beater and Potato Masher, Campers' or Portable Oven, Abell Coffee Pot, Combined Grater and Saw Cutter, Enameled Repair Knob, Automatic Rope Attachment, Oriental Coffee Pot, Automatic Fire Proof Flue Stopper, Ventilating Stove Pipe Collar and Thimble combined, Fruit Jar Wrench, Paxton Poacher and Steamer, &c.

HERRICK REFRIGERATOR COMPANY, Waterloo, Iowa: Catalogue of their Herrick (Northey's patent) Sanitary Refrigerators, Ice Chests, Fish Boxes, Ice Cream Cabinets and Cans, Display Cases and Coolers, Florists' Cases, &c. In addition to making all kinds of family and other Refrigerators, they also furnish butchers', grocers', creamery, hotel, medical and saloon Coolers. For their Refrigerator work they use odorless spruce, white enamel or white opal glass linings. They call special attention to their No. 2 Enamel Refrigerator, which they say never fails to make sales where the merchant gives it a place in his show window, and also to their white opal glass lining Refrigerator for high class trade. The company give exclusive agency to one agent in each city on all sizes under No. 9, with the privilege of selling No. 9 and larger sizes if he can. They state that they are now building a large addition to their factory, 100 x 100 feet, which will enable them to take better care of their trade than ever during the season.

WEST HAVEN MFG. COMPANY, New Haven, Conn.: Catalogue illustrating their manufactures, comprising the Universal Power Hack Saw, Universal Hack Saws, Utility Hack Saws, Utility Band Saws for cutting metal of all kinds, Universal Extension and Solid Frames, Utility Extension and Solid Frames and Plumbers' Hollow Mill Saw, a new tool intended to be used in an ordinary bit brace. The company state that this tool will make holes in waste pipes and stacks exact pipe size for tapping, in any material or for any connections where the pipes or appliances are already placed, often saving the cost of tearing out the whole lengths of pipe with their expensive connections.

HEMP & Co., Elm and Third streets, St. Louis, Mo.: Catalogue of their Sheet Metal Goods, Fishing Tackle

Boxes, Window Pails, Bait Boxes, &c. Separate circulars relate to the Robson Fishing Tackle Cabinet, Mack's Floating Live Box for holding fish and the Yukon Camp Stove.

EAGLE LOCK COMPANY, Terryville, Conn.: Pages for insertion in their large catalogue, which relate to Brass and Iron Secure Lever Flat Key Chest Lock, Jewel Case Lock, Mortise Desk Lock, Pin Tumbler Latch Drawer Locks, Suit Case Lock and Bolt Combined, Blanks, &c.

STRATTON & TERSTEGGE, Louisville, Ky.: Spring catalogue containing only such goods as they carry in stock and are suitable for spring sale. It contains 60 large pages, and covers Sewing Machines, Oil and Gasoline Stoves, Oil Cans and Tanks, Clothes Wringers, Washboards, Freezers, Preserving Kettles, Milk Utensils, Bird Cages, Water Coolers, Steel Goods, &c.

LALANCE & GROSJEAN MFG. COMPANY, 19 Cliff street, New York: Illustrated booklet catalogue, entitled "Agate-Nickel Steel Ware Wisdom," printed in colors and showing in an attractive way some leading articles of their extensive line of Enameled Ware for household use.

J. S. WOODHOUSE, 191 Water street, New York: Illustrated and descriptive catalogue K of Agricultural Implements, Machinery, Tools, Contractors' Supplies, Presses, Trucks, Fertilizers and goods of this general description for domestic and foreign trade. This house were established in 1843, and deal in the leading lines of goods of this character.

UNITED STATES WIRE MAT COMPANY, Decatur, Ill.: An attractively printed pamphlet entitled "Modern Mats," in which after a general reference to the subject of Mats the United States Mat is described and its advantages pointed out. These Mats are made of the best Galvanized Steel Wire, in any length, width or shape. They are referred to as handsome and ornamental as well as useful.

MARSHALL-WELLS HARDWARE COMPANY, Duluth, Minn.: The company have issued the initial number of "The Zenith," which is referred to as gotten out for the interest of the merchant who deals in Hardware. The publication contains 22 pages, magazine size, is well printed, and will doubtless be of interest to the many customers of this large and growing house.

TRADE ITEMS.

GEORGE H. BISHOP of Geo. H. Bishop & Co., Saw manufacturers, Cincinnati, Ohio, has recently returned from a nine weeks' business trip through the Northwest, Pacific Coast and back through the Central West. Mr. Bishop found business good all over in retail lines, but stated that the jobbers were holding off to see what would be the outcome of the movement for the consolidation of jobbing interests. Seattle he referred to as sure to become a great distributing center for Pacific Coast, Oriental and Alaskan trade.

JOHN H. TEBBENHOFF, who for 26 years has been connected with the house of Vom Cleff & Co., 107 Duane street, New York, importers and dealers in Cutlery and Hardware, has recently associated himself with the firm of Max Klaas, 298 Broadway, New York. Mr. Klaas is well known as an importer of various kinds of Cutlery made abroad, and Mr. Tebbenhoff will continue to call on his friends in the trade, with which he has long been identified.

THE BLOCH AXLE COMPANY, Mobile, Ala., who had expected to have their patent Axle on the market before the present, have been prevented by unavoidable delays in procuring the necessary castings. They hope to have this remedied very shortly.

W. H. MOULTON, who for the past two years has been industrial secretary of the Cleveland Chamber of Commerce, has severed his connection with that institution to become assistant manager of the Osborn Mfg. Company, who are large makers of Brushes, Brooms and Foundry Supplies. Mr. Moulton is a graduate of the Worcester, Mass., Polytechnic Institute, and has had a large experience in manufacturing lines. He

comes with the Osborn Mfg. Company just as they are preparing to go into their own large plant, situated in the center of the manufacturing district on Hamilton street, Cleveland. In securing Mr. Moulton the Osborn Mfg. Company are making a valuable addition to their organization, and he will find, in this growing and enterprising company, much to engage his talent and enthusiasm.

AMONG THE HARDWARE TRADE.

L. F. Holloway & Co. have engaged in the Hardware, Stove, Agricultural Implement and Plumbing and Tinsmithing business in Fremont, Neb., succeeding Hobbs & Jones. The new firm are making a number of improvements in the store and adding to the stock.

Womacks & Kirby have succeeded W. N. Womacks in the Hardware, Stove, Agricultural Implement, Buggy and Sporting Goods business in Blue Springs, Mo.

Bigham Hardware & Supply Company, Ellwood City, Pa., have incorporated with a capital stock of \$15,000. They are successors to Grove & Co.

L. Miksck has disposed of his Hardware business in Gradenhuttan, Ohio, to Cummings & Co., who will continue at the old stand.

Dawley Hardware & Furniture Company, Rocky Ford, Col., have increased their capital stock to \$25,000. Their business is both wholesale and retail. They have recently started a new store at Holly, Col., with same lines as at Rocky Ford.

Ben. Mohme has disposed of his interest in the firm of Seibel & Mohme, Sigourney, Iowa, to his partner, Frank J. Seibel, who will continue under the style of Seibel Hardware Store.

W. S. Chandler has withdrawn from the Hardware firm of Chandler Bros., Marengo, Iowa, and the style is now M. W. Chandler & Son.

C. G. Krokstrom has succeeded Krokstrom & Nelson in the Farm Implement, Buggy and Harness business at Elsmore, Kan.

Richard Marshall has purchased an interest in the Hardware business of Geo. B. Donahue & Co., Upper Troy, N. Y.

The Hardware and Agricultural Implement business of Henry Schluckebier, Petaluma, Cal., has been incorporated under the style of Schluckebier Hardware Company, who will continue at the old stand.

Gibson Bros., dealers in general merchandise, including Hardware, Larkin, Kan., have been succeeded by Gibson & Artman.

Chaffer & Bishop have succeeded Tobias Hardware Company, Washington, Ill. The new proprietors of the business will make improvements in the store and increase the stock, their purpose being to conduct a first-class Hardware and Farm Implement establishment.

E. P. Brant has purchased the general merchandise stock of Fee & Stewart Company, Melbourne, Fla. The latter concern will continue in the general Hardware line, both wholesale and retail. They expect also to open a store at Fort Pierce.

Dorland & Eaton have disposed of their Hardware business in Pisgah, Iowa, to C. M. Nuzum.

R. L. Reid has succeeded Reid & Alleger in the Hardware and Farm Implement business in Walter, O. T.

J. C. Scott, Roscoe, Texas, has bought the business of the Roscoe Mercantile Company and removed the stock to his establishment. Mr. Scott now deals in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, Dry Goods, Groceries, &c.

He has completed a large addition to his store, and has also leased a wareroom for the storage of Heavy Hardware and Implements.

J. C. Wright, dealer in Hardware, Stoves, Sporting Goods, Agricultural Implements, Harness, &c., Ashland, Neb., have been succeeded by Wright & Stone. The firm have doubled the stock formerly carried.

William S. Whitney has withdrawn from the firm of Noxon & Whitney, Middletown, Conn. The business will be continued by the remaining partner, Joseph F. Noxon, under the name of the Noxon & Whitney Company.

H. A. Shively, Mahomet, Ill., has closed out his stock of Implements and Hardware to Black & Holt, who will continue at the old stand.

H. C. Wey & Son have succeeded J. K. Jones Hardware Company, Hobart, O. T. This business is both wholesale and retail, and comprises a full stock of Hardware and Farm Implements and Machinery. The firm are putting in new shelving and replenishing the entire stock. They are also adding a Carriage and Wagon house. When their improvements are completed they will have an especially well arranged and complete establishment.

Strain & Hill have succeeded J. O. Strain in the Hardware, Stove and Farm Implement business in Jamestown, Kan.

C. L. Snow has disposed of his interest in the Ripley Hardware Company, Ripley, O. T., to his partners, who will continue under the same style as heretofore.

W. M. Weaver has sold his interest in the Dublin Hardware Company, Dublin, Va., and opened a store at Marion, Va., under the style of Marion Hardware Company.

Henry Soule has disposed of his Hardware, Stove and Sporting Goods business in Trimble, Mo., to O. E. Connell.

Foster Hardware Company have succeeded J. H. Parks in the Shelf and Heavy Hardware, Stove and Tinware business in Lorimer, Iowa.

Evington & Co., Richland, Mo., have sold their business to Young & Morgan, who will continue at the old stand. Messrs. Young and Morgan were members of the former firm, Mr. Evington withdrawing from the business.

C. A. Allen & Co. have purchased the Hardware business of O. P. Shoff at Moorhead, Iowa.

H. L. Hahnenkratt and L. C. Ames, formerly of Phillipsburg, Kan., have entered the Hardware business in Washington, Kan., under the style of Hahnenkratt & Ames. Besides Hardware, they will deal in Stoves, Tinware, Sporting Goods, Wind Mills, &c.

L. E. Dietel is successor to Chamberlain & Dietel in the Hardware, Farm Implement and Buggy business in Hawkeye, Iowa.

The Wilson Hardware Company have succeeded Wilson-Beemer Hardware Company, Washington, Iowa, wholesalers and retailers of Shelf and Heavy Hardware, Stoves, Tinware, Furnaces, &c.

A. H. Fogg & Co., Hardware merchants, Houlton, Maine, have incorporated under the style of Almon H. Fogg Company. The officers of the corporation are Almon H. Fogg, president; Clarence H. Pierce, treasurer; Charles H. Fogg, clerk. The directors are A. H. Fogg, C. H. Pierce, G. Edward Wilkins and C. H. Fogg.

G. E. Wilkins, who has been with the concern for 17 years, and Charles H. Fogg, who has been in their employ about 12 years, are thus taken into the business. The question of incorporation has been talked of by them for over a year, and its culmination at this time is a fitting reward to the faithful work of the two clerks who have been given an interest in the business.

Hunter Hardware Company, Rockford, Ill., have purchased the stock of Billings Bros., Hardware dealers. The stock will not be removed, but the Hunter Company will conduct both stores.

The S. B. Hubbard Company, wholesale and retail Hardware, Iron and Steel, &c., Jacksonville, Fla., have sent us a photograph showing the temporary quarters which they have occupied since the destruction of their establishment in the great fire of May 3 last. This is a one-story structure, 210 feet square, and was erected in about two weeks' time. Their new buildings are, however, rapidly approaching completion, and the company hope to take possession within the next two months.

MISCELLANEOUS NOTES.

Ricinate Fire Proof Paint.

Richmond Supply Company, Richmond, Va., as sole agents, are calling attention to the Ricinate fire proof paints and kalsomine. The company claim that wood painted with Ricinate takes from 200 to 300 degrees more heat to set it afire than when painted with non-fire proof paint; that wood covered with it will not blaze when set on fire; and that Ricinate wears and weathers as well as, and costs little, if any, more than, high grade non-fire proof paints. The company issue a circular containing testimonials from manufacturing and other concerns who have used the paint. It also directs attention to their Dura Asphalta, which is referred to as a highly elastic paint for roofs of factories, warehouses and residences.

Marble's Skinning Knives and Camp Carvers.

The Marble Safety Axe Company, Gladstone, Mich., in addition to a line of Ideal hunting knives and Handy fish knives manufactured by them, and illustrated in these columns at different times, are now making for sportsmen a skinning knife, equal in quality to the rest of their goods. The knife is of an approved pattern and very thin. The handles are of German stag, firmly riveted to the tang. The knives weigh about 4 ounces each, and the blades vary in length from $4\frac{1}{2}$ to 5 inches. In the same general category is a new line of camp carvers now being produced. They are of the same fine material as the skinning knives, with 8-inch blades, thin and of fine temper, intended principally for slicing meat, bread, vegetables, &c.

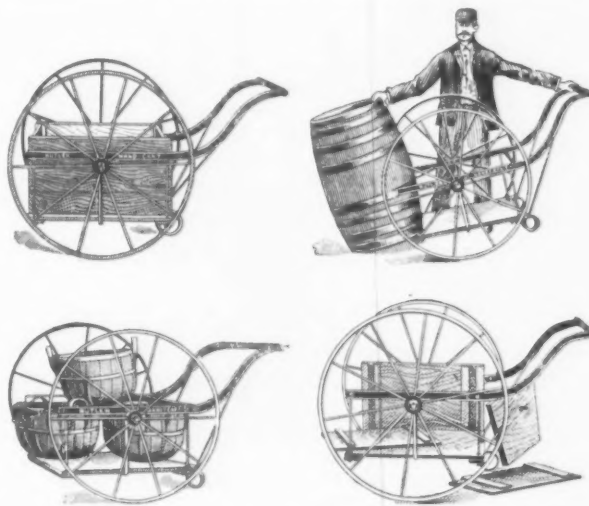
Standard Tool Company.

The Standard Tool Company, Cleveland, Ohio, are manufacturing an extensive line of spring cotters, flat spring and riveted keys for use in the manufacture of agricultural implements, hardware specialties, couplers, &c.; also cotters longer than 8 inch, commonly known as cellar box cotters, for bridge builders, car builders and railroads, and brass and copper cotters for use in the manufacture of electrical apparatus.

Butler Steel Hand Cart.

Roderick Lean Mfg. Company, Mansfield, Ohio, have recently begun the manufacture of the Butler steel hand cart, several uses of which are here illustrated. This is referred to by the manufacturers as a new departure in hand cart making, combining the good features of a barrel cart, hand cart and warehouse truck. The body hangs low, and can be tipped forward and pushed under any heavy article in the same way as a warehouse truck; it saves lifting, and makes easy hauling and load-

ing; it will carry a larger load than the wheelbarrow and is easily dumped. It is made wholly of steel, except the platform, which is of hard wood. The steel wheels, 36 inches in diameter, are painted carmine and the wood body blue. The wood platform is 28×32 inches in dimensions. The wood side boards are 15 inches high, and can be instantly removed if necessary. It will easily carry a load of 500 pounds. It is recommended for a great variety of uses, such as will readily

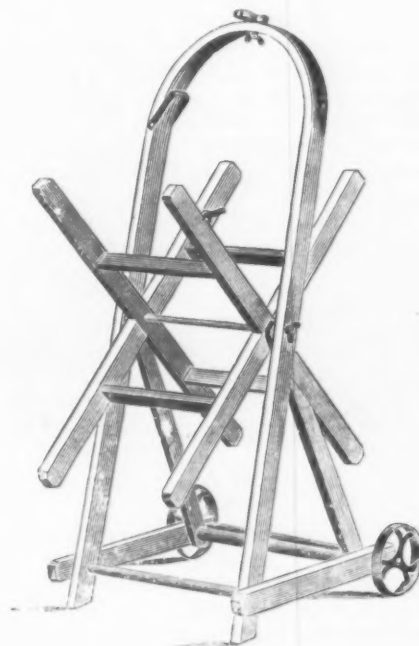


Some Uses for Butler's Hand Carts.

suggest themselves, and especially for the farmer, merchant, dairyman, mechanic, gardener, liveryman, mason, grocer and printer. These carts are designated as Nos. 1 and 2, No. 1 being the cart without the side boards; No. 2 having side boards, which make it useful for carrying material in bulk or small articles.

Improved Hose Reel.

J. A. Dubuar Mfg. Company, Northville, Mich., for whom Hendricks & Class, 150 Nassau street, New York, are direct representatives, have recently begun the manufacture of an improved form of bow top garden hose reel, as illustrated. The particular feature of this reel, as now made, is that it is much stiffer and more rigid,



Improved Bow Top Garden Hose Reel.

there being four legs instead of two as heretofore. It is made of hard wood, is strong and substantial, and can be knocked down for shipment in bundles of one-half dozen each.

Hand Power Oil Paint Spraying Machine.

The Wallace Supply Company, 56 Fifth avenue, Chicago, branch office 15 Cortlandt street, New York, have placed a hand power paint spraying machine on the market that will handle oil paint successfully. It is a portable machine for oil painting, that a man can easily carry around and do satisfactory work with, with-

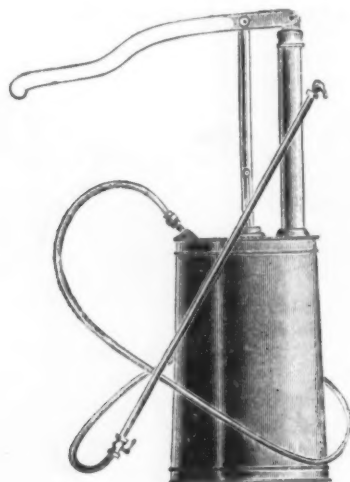


Fig. 1.—Hand Power Oil Paint Spraying Machine.

out having to take along with him a steam engine and an air compressor. The machine shown in Fig. 1 is complete and portable in itself and is independent of any outside source of power. It is built in two sizes, of 10 and 5 gallons capacity respectively. The paint is put into the receptacle or tank, which is made of heavy sheet steel, and by means of a specially designed pump is forced at a high pressure through the nozzle, which is also of a special type. It is stated that by the use of a spraying machine one man can do the work of ten

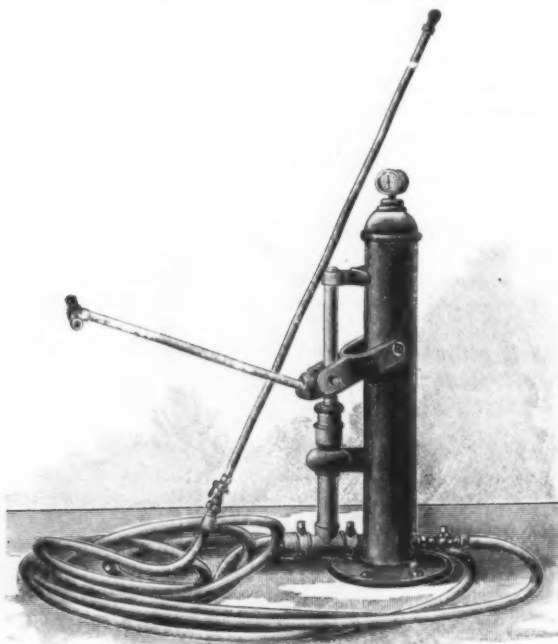


Fig. 2.—Style C Machine for Whitewashing.

men as against area of surface covered by hand work with the brush. The spray on complex iron work, bridges, walls, &c., will reach all crevices and obscure corners which it is impossible to reach with the brush, and any workman may learn to handle the machine with success in a few hours.

To meet the demand for a cheaper grade of machine for whitewashing the Wallace Supply Company have gotten up a line of whitewash and cold water paint spraying machines, ranging in price from \$7 to \$25. Fig. 2 shows their new style C machine. This stands on a base all compact and complete with a cast iron

tank, iron pump, brass valves and cocks, 10-foot suction hose and 25-foot delivery hose.

Ironsides Improved Tormay Oiler.

The Ironsides Company, Columbus, Ohio, are manufacturing the Ironsides improved Tormay oiler. The device, which is herewith illustrated in two different forms for economically applying oil to working parts, is reputed to have had its origin in an operating department of pronounced wastefulness, and originally provided for the oiling of mine car wheels, but that its accredited benefits duly adapted it to the operating departments of the various classes of mining and other machinery and general manufacturing institutions wherever lubricants are required. A saving of as great as 50 per cent. in both labor and also oil is alleged to have followed its adoption in some of the larger coal mining properties. Not unlike other innovations, the earlier productions are said to have proven deficient in construction. In the oiler as now offered former inherent weaknesses have been eliminated and suggested improvements from the



Fig. 1.—Ironsides Improved Tormay Oiler, $\frac{1}{4}$ Gallon Capacity.



Fig. 2.—Ironsides Improved Tormay Oiler, $1\frac{1}{2}$ Gallons Capacity.

more experienced users incorporated, and it is described as an article of superior design, workmanship and great durability. The oiler consists of a central working barrel, containing a plunger and surrounded by an oil reservoir. Openings in the working barrel, sealed or unsealed, according to position of plunger, communicate with the oil reservoir. The adjustability of the stroke of plunger governs the quantity of oil forced at each operation. When not in use its contents are not only preserved from leakage, but also protected from dust and other impurities.

Which Way Pocket Level.

E. G. Smith, Columbia, Pa., is manufacturing the Which Way pocket level, shown herewith, which is now being brought to the attention of the hardware trade. The level is about the diameter of a silver dollar and $\frac{3}{8}$ inch thick. It is referred to as made from solid steel and



Which Way Pocket Level.

nicely nickered. The lens is ground glass. Special attention is called to the sensitiveness of the level, and the manufacturer remarks that it does not matter which way the work is out, the level will show it. The level is guaranteed not to leak.

The H. & C. Wrought Steel Registers.

We present herewith illustrations showing the appearance and construction of the new H. & C. wrought steel hot air registers, manufactured by the Hart & Cooley Company of New Britain, Conn. Among the special points to which attention is drawn by the manufacturers of these goods are that the registers are practically unbreakable, and that, while stronger than cast

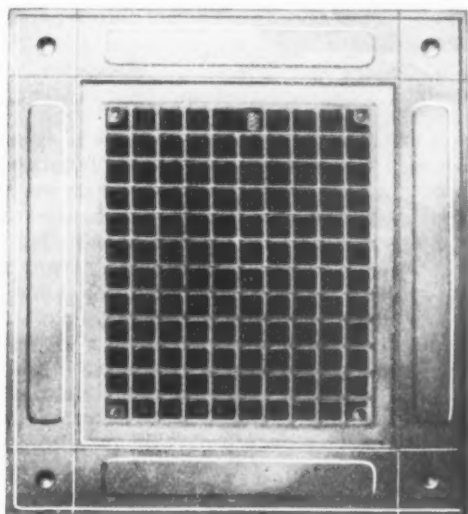


Fig. 1.—The H. & C. Wrought Steel Register.

iron, they average over 40 per cent. lighter in weight, making a considerable saving in freight charges. The register boxes, being of shallow depth, require less room than others in use. In most cases the register will take the place of the convex face registers for side wall use. The border frames are provided with lugs at each corner, as shown in Fig. 1, for centering in the floors, and these lugs may be readily hammered flat if desired, thus

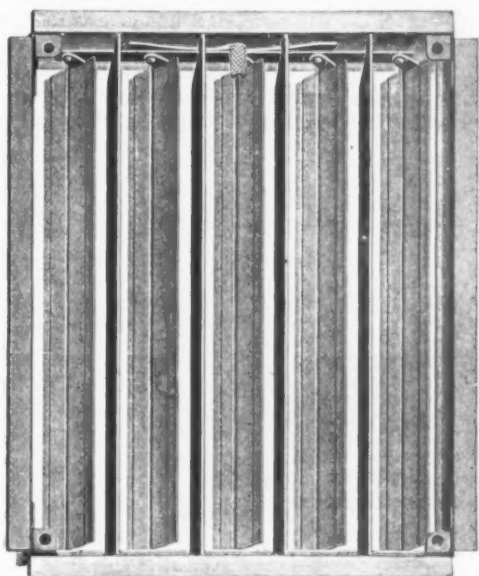


Fig. 2.—The Valves.

obviating carrying in stock borders both with and without ribs. Tin box loop holes are provided in the borders in the same location in each size as in the standard makes of cast iron registers. The register boxes are also equipped with tin box loop holes for use in fastening to side walls, for which purpose a flange is provided on the boxes. The registers may also be fastened to side walls by screws through these flanges, thus preventing the necessity of marring the surfaces of the face plates with screws for holding the same. The registers and border frames are of standard size, and interchangeable with the standard makes of cast iron registers. Face plates of wrought brass are furnished at a very

moderate advance over steel, making a register that will retain its finish and always present a handsome appearance. The manufacturers point out that the unique brass finish makes an especially attractive register. Register faces are finished to match standard finishes of hardware, as well as of the standard register

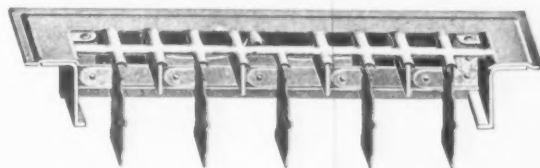


Fig. 3.—Sectional View of Face and Valves.

finishes. Each register is packed in a cardboard box, making a neat package, and these are packed in cases of a convenient size for handling.

Electrically Heated Devices.

United Electric Heating Company, 260 Randolph street, Detroit, Mich., have added to an extensive line of electrical apparatus suitable for the hardware trade several new articles, three of which are here illustrated. Fig. 1 represents a curling iron heater, features of which are its efficiency, cleanliness and freedom from fire and consequent danger. The heaters are particularly adapted to use in theater dressing rooms, hotels and other public places. Fig. 2 represents one of a very large as-

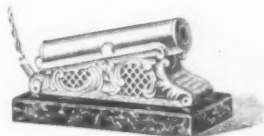


Fig. 1.—Electric Curling Iron Heater.

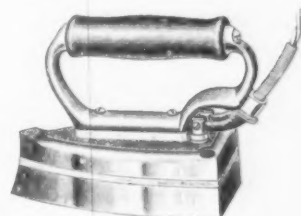


Fig. 2.—Electric Laundry Iron.

sortment of laundry and pressing irons. They are especially efficient because practically all the heat generated is utilized, no heat being wasted in heating the atmosphere. The temperature can be regulated at will; the heat is sufficient and constant always, no time being lost in changing irons. The life of the irons is a term of years, all that is necessary in renewal even then being the replacing of the heating coil, which can be done at a slight cost. Fig. 3 represents an electrically heated chafing dish, which has the advantage over the ordinary chafing dish of entire absence of flame, fire, dirt and the odor of combustion, as well as being always ready for use by turning the switch, no matches or alcohol being required. The heater is removable, so that an alcohol lamp may be used where there is no electric current, and this heater may be attached to



Fig. 3.—Electric Chafing Dish.

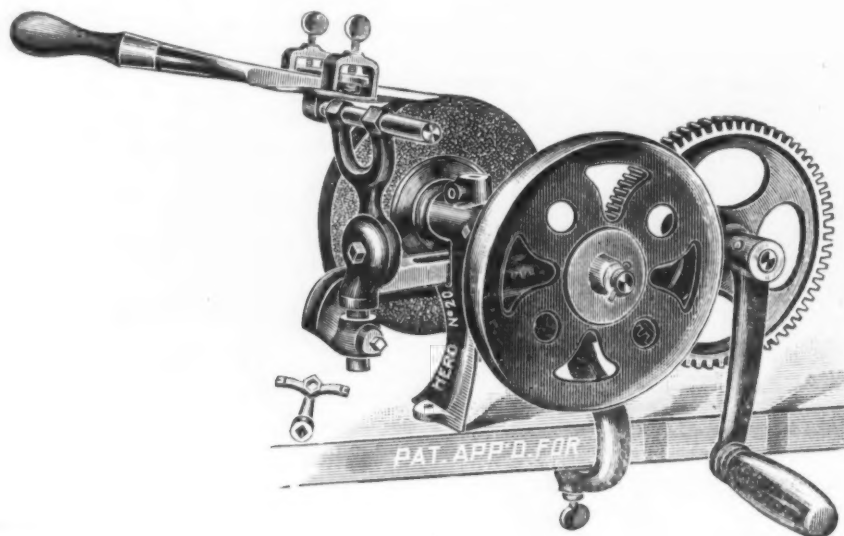
almost any chafing dish. Where this is done it is only necessary to adjust the legs so that the heater is held at the proper height. The company have also adapted these heaters for use with hot water urns, and can supply urns fitted with the heaters, or they are prepared to supply heaters fitted to almost any urn. By the use of this electric heater it is possible by means of a switch to regulate the temperature and keep it constant at any point, giving the same results always under given conditions.

Hero Bench Emery Grinder.

Robertson Mfg. Company, 38 Greenwood place, Buffalo, N. Y., have just put out the Hero bench emery grinder No. 20, here shown. It has some of the features of their No. 10 Hero emery grinder, which has already been illustrated in these columns, the No. 10 being a column machine instead of for bench installation. The illustration herewith shows their universal tool carriage and clamp, by the use of which a tool can be ground accurately square or any angle or bevel. By this

Worcester Seed and Fertilizer Sower.

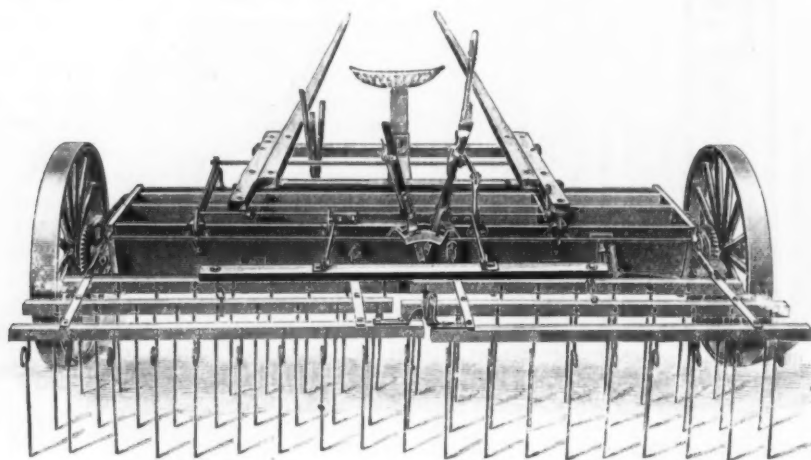
The Richardson Mfg. Company, Worcester, Mass., have just begun the manufacture of the Worcester Broadcast seed and fertilizer sower, as here illustrated. It is so constructed that it will sow grass seed, grains of all kinds and fertilizers. Any desired quantity may be sown to an acre and accurately gauged, sowing equally well mixed seeds, Hungarian, as well as oats, barley, wheat, rye, buckwheat, &c. It will sow seed broadcast in any way desired. The seed is put into separate hop-



Hero Bench Emery Grinder No. 20.

method it is also claimed that it is much less work to finish sharpening on an oil stone, as the ground surface of the tool will be slightly concaved, thus allowing the fine edge to come in contact with the oil stone without working the whole surface down on the stone to get a fine edge. Each machine has one best make emery wheel, 6 x 3/4 inches, and an extra holder for skate and cutlery grinding. By reversing the tool rest it is in position for grinding cold chisels, drills, machine parts, &c. The machine can be carried in the tool chest furnished with

pers, and either one kind only, any two kinds, or all three kinds together, if necessary, can be sown at the one process, gauging the amount of each per acre as wanted. The fertilizer hopper has a forced feed which gives a positive and uniform distribution, wet material not clogging it. It will sow all kinds of commercial fertilizer, as well as ashes, lime and plaster. By the turning of a set screw and the placing of a rod in different holes, any required quantity per acre may be sown, varying from 75 to 2400 pounds to the acre. The harrow at-



Worcester Broadcast Seed and Fertilizer Sower.

a special clamp with screw holes in frame to fasten to the bench with the necessary wrenches to fit nuts, &c. A foot power connection is also made, and can be applied at any time. The shaft is of steel, 3/8 inch in diameter, the bearing in the head being milled from the solid to a fine bearing. The machine is geared 19 to 1, and has a special mechanism arranged in the intermediate gear which allows the workman to cease turning the crank at any time while the wheel will still continue to run. The machine is compact and complete weighs 14 pounds.

tachment is so arranged that it may be removed if not wanted. It is said to do fine work in laying in the grains and mixing the fertilizer with the soil. It has a lever, so as to get any desired pressure of the teeth. The construction is such that the uneven surfaces of the ground are properly treated. It can be furnished for either one or two horses.

Geo. W. Heine has bought the Farm Implement part of the business of Heine Bros., Hooper, Neb. Heine Bros. will continue in the Hardware line as heretofore.

Universal Duster and Bellows.

Smith & Hemenway Company, 296 Broadway, New York, have just put on the market the Universal duster and bellows, as here illustrated. It is cylindrical in shape and made in four sizes of wood veneer, several

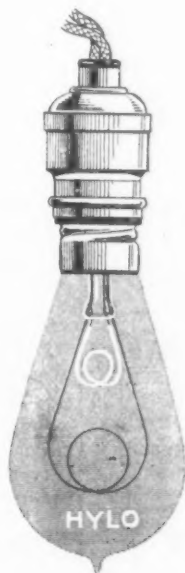


Universal Duster and Bellows.

thicknesses of which are glued together in the same way as the material for perforated wood chair bottoms. The dusters are made with both straight and curved nozzles, and are recommended especially for cleaning the many places not otherwise readily accessible with brush or feather duster, among which are show cases and windows, store shelving containing goods, sample rolls, pianos, organs, dynamos and any place that can be reached with a powerful jet of air in this way. There are no metal parts whatever in connection with the bellows to injure delicate parts, or make a short circuit when it is used around electrical apparatus. The wood material from which they are made is seasoned for two years before being formed in shape. The sizes are length of barrel 20, 22½, 25 and 32 inches. The weight in the order named of each is 10½, 30½, 33 and 32½ ounces, the latter being light for its size and the 25-inch barrel being extra heavy.

Hylo Incandescent Electric Lamp.

The Phelps Company, 33-37 State street, Detroit, Mich., are manufacturing the Hylo incandescent electric lamp, here illustrated. It is stated that this lamp can



Hylo Incandescent Electric Lamp.

be used in any place where the common electric lamp is used, and that no particular skill is required to put it up or operate it. Where the socket is on the ceiling the company supply a manipulator or handle for turning the Hylo up and down. The novelty of this lamp is that the user can get the maximum light or turn it down to a mere glimmer at will. It has two light giving filaments, a large filament and a smaller one, the latter being called the "baby." These are connected at the base of the lamp, so that they may be burned both in series or the large one alone. On the base of the lamp there is a spring, which when pressed down by screwing the lamp into the socket short circuits the small filament and cuts out the "baby." In their 16 candle-power Hylo the small filament takes only 10

watts, and, it is claimed, gives the greatest amount of light for the least amount of current of any filament yet made. The diameter of the small filament is only 0.0025 inch. The company are also making these lamps in other combinations, such as 2 and 20 candle-power, 220 volts; 2 and 32 candle-power and ½ and 8

candle-power. They also have a Ruby Hylo for photographers' dark room.

Bradley Detachable Shelf.

Atlas Mfg. Company, New Haven, Conn., have just put on the market the Bradley detachable shelf, as here illustrated in detail. Fig. 1 shows one of the two brack-

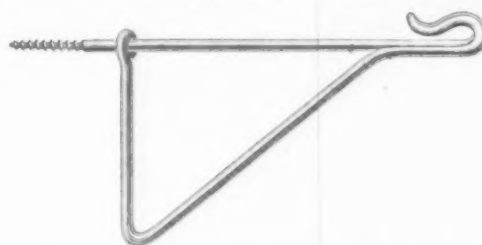


Fig. 1.—Bracket for Bradley's Detachable Shelf.

ets necessary to sustain the shelf. Fig. 2 illustrates the shelf in the act of being forced into place. Fig. 3 represents the shelf and bracket complete as in use. No screws, nails or tools, it will be observed, are required to put the shelf in position. The buyer is able to buy

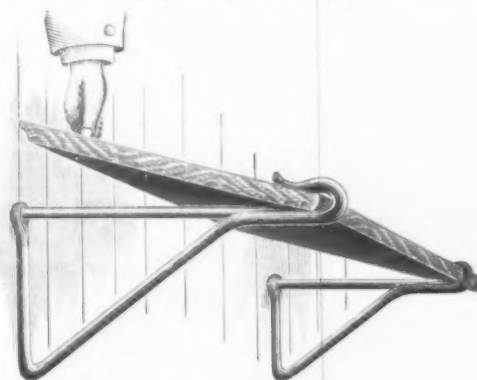


Fig. 2.—Method of Erecting Shelf.

the article complete (board and bracket), ready to put up. This device is made in two styles of shelf and two lengths of each; one has japanned brackets and white-wood board, the other being furnished with nickel plated brackets and oak board. The sizes of each are 4½ x 17

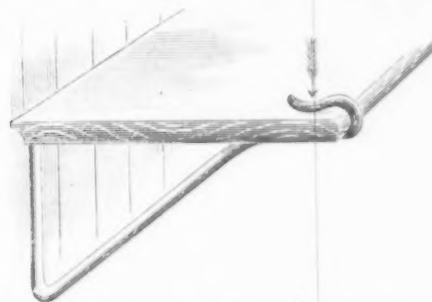


Fig. 3.—Section of Shelf Ready for Use.

inches and 4½ x 21 inches. The shelves are 5-16 inch thick, and will hold all the weight that is likely to be put on them. They are put up one dozen in a paper box and 12 dozen in a crate.

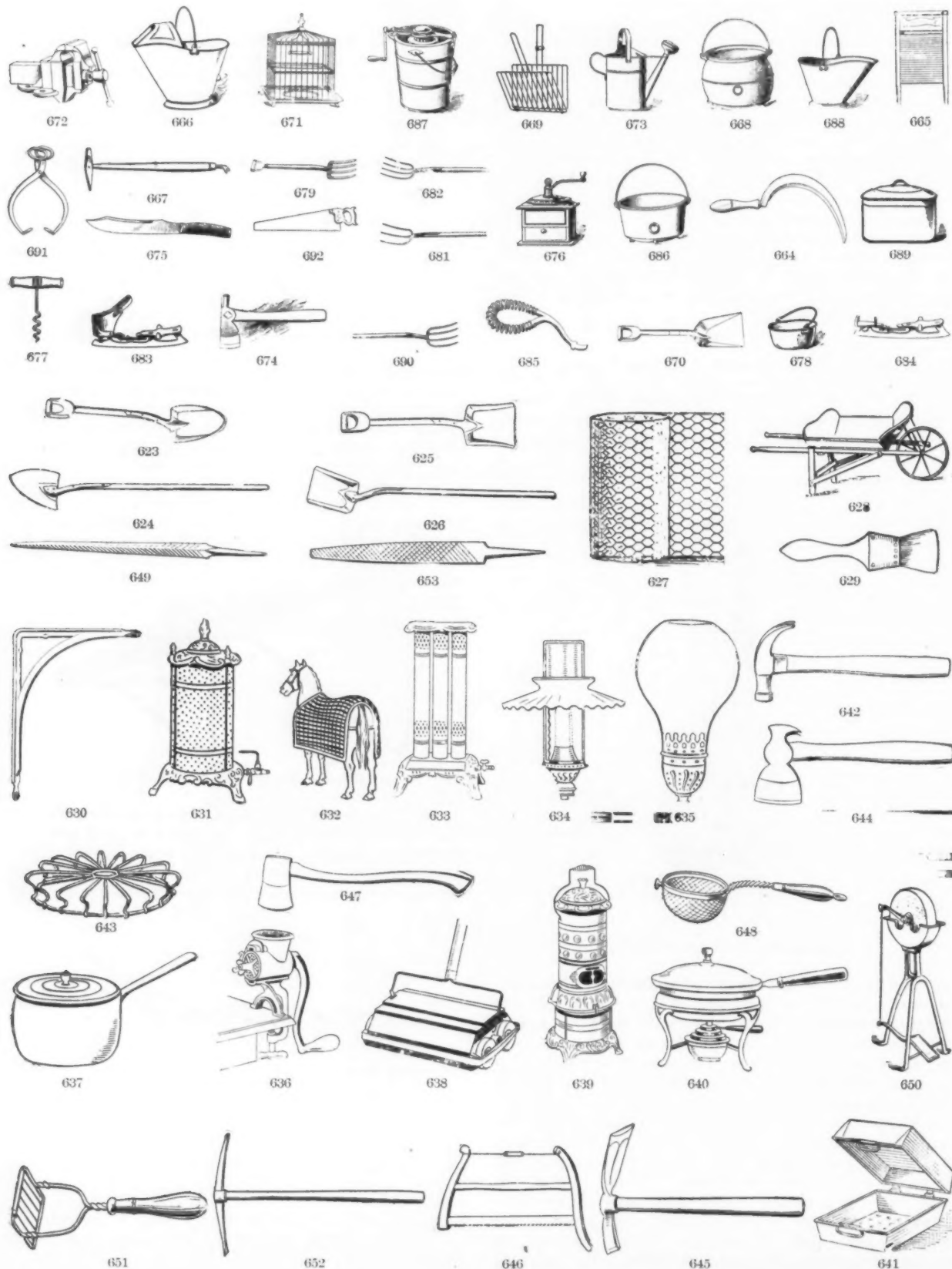
PUBLISHERS' DEPARTMENT.

The Iron Age Advertising Cuts.

We illustrate herewith some recent additions to our line of advertising cuts for hardware merchants. Some of the cuts, it will be observed, are of very small size, permitting the use of a number of them in a single advertisement occupying moderate space. The price of

these cuts is 20 cents each. Discounts: 6 to 20 cuts, 16 2-3 per cent.; 20 to 40 cuts, 20 per cent.; 40 or more cuts, 25 per cent. Nearly 200 small cuts of salable articles are comprised in this line, together with numerous cuts of special designs suitable for advertising various articles. Our 16-page circular, with prices, illustrating our line of advertising cuts will be sent on request.

DAVID WILLIAMS COMPANY,
232-238 William St., New York.



Current Hardware Prices.

REVISED APRIL 15, 1902.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33½@33½@10% signifies that the price of the goods in question ranges from 33½ per cent. discount to 33½ and 10 per cent. discount.

Cut Prices.—In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (April 4, 1901), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters Blind—

Domestic, 7 doz. \$3.00... 33½@33½@10%
North's... 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent... 25¢5¢
Taplin's Perfection... 50%

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—American—

Armand Hammer, Wrought... 85¢@84¢
Buel Patent Trenton... 75¢@74¢
Eagle Anvil... 75¢@74¢
Hay-Budden, Wrought... 9¢@9¼¢
Horseshoe brand, Wrought... 9¢@9¼¢

Imported—

Peter Wright's... 9¢@9¼¢

Anvil, Vise and Drill—

Millers Falls Co., \$18.00... 20%

Apple Parers—See Parers, Apple, &c.

Aprons, Blacksmiths'—

Hull Bros. Co.:
Lots of 1 doz... 25%
Sma. or Lots... 20%
Lots of 3 doz... 30%

Augers and Bits—

Com. Double Spur... 70¢@70¢10%
Doring Machine Augers... 70¢@70¢10%
Cur Bits, 12-in. twist... 60¢@60¢10%
Jennings' Pattern... 60¢@60¢10%
Auger Bits... 50¢@50¢10%
Ford's Auger and Car Bits... 40¢@40¢10%
Forster Pat. Auger Bits... 25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list... 40%
No. 30, R. Jennings' list... 50%
Russell Jennings... 25¢@10¢2½¢
L'Hommedieu Car Bits 15¢@15¢10%
Mayhew's Countersink Bits... 45%
Pugh's Black... 20%
Pugh's Jennings' Pattern... 35%
Snell's Auger Bits... 60¢@10%
Snell's Bell Hangers' Bits... 60¢@10%
Snell's Car Bits, 12-in. twist... 60%
Wright's Jennings Bits (R. Jennings' list)... 50%

Bit Stock Drills—

Standard List... 65¢@65¢5%

Expansive Bits—

Clark's small, \$18; large, \$20... 50¢@10%
Lavigne's Clark's Pattern, No. 1, 7 doz. \$20; No. 2, \$18... 50¢@10%
C. E. Jennings & Co., Steer's Pat... 33%
Swan's... 60%

Gimlet Bits—

Common Double Cut, gro. \$2.25@2.75;
German Pattern... gro. \$4.00@4.75

Hollow Augers—

Bonney Pattern, per doz. \$11.00@11.50
Amos... 25¢@10%
New Patent... 25¢@10%
Universal... 20%
Wood's Universal... 25%

Ship Augers and Bits—

Ford's... 40%
Snell's... 40%
C. E. Jennings & Co.:
L'Hommedieu's... 15¢@10%
Watrous'... 40%

Awl Hafts, See Hafts, Awl.

Awls—

Brad Awls:
Handled... gro. \$2.75@3.10
Unhandl'd, Shouldered, gro. \$3@3.60
Unhandl'd, Patent... gro. 66¢@70¢
Peg Awls:
Unhandl'd, Patent... gro. 31¢@34¢
Unhandl'd, Shouldered, gro. 55¢@70¢
Scratch Awls:
Handled, Common, gro. \$3.50@4.00
Handl'd, Socket, gro. \$11.50@12.00

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

First Quality, factory brands... \$6.00
First Quality, jobbers' brands... \$5.75
Second Qual. 1st... \$5.00@5.25

Axle Grease—See Grease, Axle.

Axles—

Concord, Loose Collar... 4½¢@5¢
Concord, Solid Collar... 5½¢@5½¢
No. 1 Common... 3½¢@3½¢
No. 1 Com. New Style... 3½¢@4¢
No. 2 Solid Collar... 4½¢@4½¢
Nos. 11 to 14... 70¢@70¢10%
Nos. 15 to 18... 75¢@75¢10%
Nos. 19 to 22... 75¢@75¢10%

Boxes, Axle—

Common and Concord, not turned... 15¢@15¢4¢
Common and Concord, turned... 15¢@15¢4¢

Half Patent—

lb. 4¼¢@5¢

Balances—Sash—

Caldwell new list... 60%
Pulman's... 60%

Spring—

Spring Balances... 50¢@10¢60%
Chatillon's:
Light Spg. Balances... 40¢@10%
Straight Balances... 40%
Circular Balances... 50%
Large Dial... 30%
Petouze... 50%

Barb Wire—See Wire, Barb.

Bars—Crow—

Steel Crowbars, 10 to 40 lb., per lb... 2½¢@3¢

Beams, Scale—

Scale Beams, List Jan. 12, '82... 40¢@10%
Chatillon's No. 1... 30%
Chatillon's No. 2... 40%

Beaters—Egg—

Standard Co.:
No. 9 Rip... \$4.50
No. 10 Dover Family Size... \$1.00
No. 15 Dover Hotel Size... \$15.00
Rival... \$9.00
Taplin Mfg. Co.:
No. 60 Improved Dover... \$6.50
No. 75 Improved Dover... \$7.50
No. 75-2 Imp'd Dover, Fin'd... \$8.00
No. 100 Improved Dover... \$8.00
No. 102 Improved Dover, Fin'd... \$9.50
No. 150 Improved Dover, Hotel... \$15.00
No. 152 Imp'd Dover, Hotel, T'd... \$17.00
Lyon's Standard size... doz. \$17.50
Wonder (S. S. & Co.)... gro. \$7.50

Bellows—

Blacksmith, Standard List... 70¢@70¢10%
C. E. Jennings & Co., Blacksmith... 60¢@10%
C. E. Jennings & Co., Hand... 33%
Blacksmiths—

Inch... 31 33 34 36 38 40
Eac. \$3.50 3.75 4.25 4.80 5.35 6.15
Extra Length:
Each \$4.00 4.55 5.10 5.60 6.40 7.50

Molders—

Inch... 9 10 11 12 13 14 16
Doz... \$6.75 7.25 8.50 9.50 12.00 14.50

Bells—Cow—

Ordinary goods... 75¢@5¢75¢10%
High grade... 70¢@70¢10%
Jersey... 75¢@10%
Texas Star... 50%

Door—

Abbe's Gong... 45%
Barton Gong... 55%
Home, R. & E. Mfg. Co.'s... 65¢@10%
Lever and Pull, Sargent's... 40¢@40¢10%
Yankee Gong... 35%

Hand—

Hand Bells, Polished... 60¢@5¢60¢10%
White Metal... 55¢@55¢10%
Nickel Plated... 50¢@50¢10%
Swiss... 60¢@60¢10%
Silver Chime... 35¢@35¢10%

Miscellaneous—

National Bell Foundry Co.:
Superior Cast Steel Church and School Bells... 50¢@10¢50¢60%
Wilmut & Hobbs Mfg. Co., Gongs... 70%

Belting—Rubber—

Agricultural (Low Grade)... 75¢@10¢80%
Common Standard... 75¢@75¢10%
Standard... 70¢@70¢10%
Extra... 60¢@10¢50%
High Grade... 50¢@10¢50¢10¢5%
Boston Belting Co.:
Seamless Stitched, Imperial... 45¢@5%
Boston... 50¢@5%
Niagara... 60¢@5%

Leather—

Extra Heavy, Short Lap... 50¢@10¢60%

Regular Short Lap—

Standard... 60¢@10¢65¢10%
Light Standard... 65¢@70%
Leather Lacing... 60¢@10%

Cotton—

Rosendale-Reddaway B. & H. Co.:
Sphinx Brand... 60¢@10%
Durable Brand... 70%

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters... 30%
Stoddard's Lightning Tire Upsetters, No. 1, \$3.75; No. 2, \$6.50; No. 3, \$9.50; No. 4, \$14.75.

Bicycle Goods—

John S. Leng's Son's 1899 list:
Chain... 50%
Parts... 50%
Spokes... 50%
Tubes... 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—Tackle—

Common Wooden... 70¢@10¢75%
Cleveland's steel... 60¢@10¢70%
Ford's Star Brand Self Lubricating... 60¢@10%
Hollow Steel, Ford's Pat. Star Brand... 50¢@10%

Lane's Patent Automatic Lock and Junior—

Stowell's Novelty, Mail Iron... 50¢@10%
See also Machines, Hoisting.

Boards Stove—

Zinc, Crystal, &c... 40¢@40¢10%

Boils—

Carriage, Machine &c.—

Common, list Jan. 31, '95... 60¢@5¢60%
Norway Iron, \$3.00, list Oct. 7, '94... 80¢@80¢5%
Phila. Eagle, \$3.00, list May 21, '99... 80¢@80¢5%

Bolt Ends, list Jan. 30, '95... 70¢@5¢70% Machine, list Oct. 1, '99... 65¢@5¢65% Machine with C & T. Nuts... 65¢@74¢65%

NOTE.—Jobbers are in many cases underbidding the manufacturers.

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:
Inch... 3 4 5 6 8
Per doz... \$0.26 .30 .39 .47 .65

Cast Iron Spring Foot—

Inch... 6 8 10
Per doz... \$1.00 1.25 1.75

Cast Iron Chain, Flat, Japanned—

Inch... 6 8 10
Per doz... \$0.75 1.05 1.50

Cast Iron Shutter, Brass Knobs—

Inch... 6 8 10
Per doz... \$0.57 .80 1.00

Wrought Barrel Brass Knob—

Inch... 3 4 5 6 8
Per doz... \$0.44 .50 .61 .70 1.23

Wrought Barrel... 70¢@10¢75¢5% Wrought "Bronzed... 40¢@50¢10% Wrought Flush, B. K... 50¢@10¢60¢10% Wrought Shutter... 40¢@10¢10¢60¢5% Wrought Square Neck... 50¢@50¢10% Wrought Sunk... 50¢@50¢10% Ives' Patent Door... 60%

Stove and Plow—

Plow... 60¢@5¢60%
Stove... 77½%

Tire—

Common... 77½%
Norway Iron... 80¢@80¢5%
American Screw Company:
Norway Phila. list Oct. 16, '94... 82½¢
Eagle Phila. list Oct. 16, '94... 85¢
Bay State, list Dec. 28, '99... 77½%
Franklin Moor Co.:
Norway Phila. list Oct. 16, '94... 83½¢
Eagle Phila. list Oct. 16, '94... 85¢
Eclipse, list Dec. 28, '99... 77½%
Port Chester Bolt & Nut Company:
Empire, list Dec. 28, '99... 77½%
Keystone Phila. list Oct. '94... 85¢
Norway Phila. list Oct. '94... 82½¢
Upson Nut Co.:
Tire Bolts... 77½%

Borers, Tap—

Borers Tap, Ring, with Handle:
Inch... 1¼ 1½ 1¾ 2
Per doz... \$4.30 5.00 6.75 7.25

Inch... 2¼ 2½ 2¾ 3 Per Doz... \$4.65 5.50 6.75 7.50

Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.85; No. 3, \$2.50 each... 25%

Boring Machines—See Machines, Boring.

Boxes, Mitre—

C. E. Jennings & Co... 40%
Seavey's, per doz... \$30... 40%

Braces—

NOTE.—Most Braces are sold at net prices.
Common Ball, American... \$1.15@1.25
Barber's... 50¢@10¢60¢10%
Fray's Genuine Spofford... 60%
Fray's No. 70 to 120, 81 to 123, 207 to 414... 60%
C. E. Jennings & Co... 50¢@10%
Mayhew's Ratchet... 60%
Mayhew's Quick Action Hay Patent... 50%
P. S. & W. C. Peck's Patent... 60¢@10¢65¢5%

Brackets—

Wrought Steel... 75¢@5¢75¢10%
Bradley's Wire Shelf:
Full cases... 80%
Broken cases... 75¢@10%
Griffin's Pressed Steel... 75%
Griffin's Folding Brackets... 70¢@10%

Bright Wire Goods—See Wire and Wire Goods.

Brollers—

Wire Goods Co... 75%

Buckets, Well and Fire—

See Pails

Bucks, Saw—

By ss... \$ gro. \$48.00
Hoosier... \$ gro. \$38.00

Bull Rings—See Rings, Bull.

Butts—Brass—

Wrought list Sept., '96... 40¢@40¢5%
Cast Brass, Tiebout's... 50%

Cast Iron—

Fast Joint, Broad... 50¢@50¢10%
Fast Joint, Narrow... 50¢@50¢10%
Loose Joint... 70¢@5¢70¢10%
Loose Pin... 70¢@5¢70¢10%
Mayer's Hinges... 70¢@5¢70¢10%
Parliament Butts... 70¢@5¢70¢10%

Wrought Steel—

Table and Buck Flaps... 60%
Narrow and Broad... 60%
Inside Blind... 60¢@10%
Loose Pin... 60¢@10%
Loose Pin, Ball and Steeple... 75%
Tip... 75%

Japanned, Ball Tip Butts... 60%
Bronzed Wrt. Nar. and Inside Blind Butts... 45¢@20¢45¢55%

Cages, Bird—

Hendryx, Brass:
3000, 3000, 1100 series... 5%
1200 series... 35%
200, 300, 600 and 900 series... 40¢@10%
Hendryx Bronze... 40¢@10%
700, 800 series... 40¢@10%
Hendryx Enamelled... 40¢@10%

Calipers—See Compasses.

Calks, Toe and Heel—

Blunt, 1 prong... per lb. 3¼¢@4¢
Sharp, 1 prong... per lb. 4¢@4¼¢
Perkins' Blunt Toe... 3¼¢
Perkins' Sharp Toe... 4¢

Can Openers—See Openers, Can.

Cans, Milk—

Illinois Pattern, \$1.75 2.10 2.25 each.
Iowa Pattern... 2.40 2.60 each.
Buffalo Pattern... 2.30 2.50 e. ch.
20 30 40 qts.
New York Pattern \$3.00 3.25 3.40 each.
Baltimore Pattern \$3.50 3.85 3.10 each.

Cans, Oil—

Buffalo Family Oil Cans:
3 5 10 gal.
\$48.00 60.00 105 gro

Caps—Percussion—

Eley's E. B... 60¢
G. D... per M 32¢@34¢
F. L... per M 42¢@44¢
G. E... per M 47¢@50¢
Musket... per M 62¢@64¢

Primers—

Berdan Primers, \$1.00 per M... 5%
B. L. Caps (Sturtevant Shells) \$1.00 per M... 5%
All other primers per M \$1.22@1.27

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

Blank Cartridges:
 32 C. F., \$5.50.....10¢55
 32 C. F., \$7.00.....10¢55
 22 cal. Rim., \$1.50.....10¢55
 32 cal. Rim., \$2.75.....10¢55
 B. B. Caps, Con., Ball Sngd., \$1.90
 B. B. Caps, Round Ball.....\$1.40
 Central Fire.....35¢
 Target and Sporting Rifle.....15¢50
 Primed Shells and Bullets.....15¢10¢
 Rim Fire Sporting.....50¢
 Rim Fire Military.....15¢50

Casters—

Bed.....70¢10¢70¢10¢55
 Plate.....75¢10¢75¢10¢55
 Philadelphia.....75¢10¢75¢10¢55
 Boss.....70¢10¢55
 Boss Anti-Friction.....70¢10¢55
 Martin's Patent (Phonix).....45¢
 Payson's Anti-Friction.....70¢10¢55
 Standard Ball Bearing.....45¢
 Tucker's Patent low list.....80¢

Cattle Leaders—

See Leaders, Cattle.
Chain, Coll—
 American Coll, Jobbers' Shipments:
 3-16 3/4 5-16 3/4 7-16 3/4 9-16 3/4
 8-70 6-35 5-50 4-50 4-30 4-25
 4 1/2 1 1/2 1 to 1 1/2 inch.
 4-10 4-15 4-15 1 per 100 lb.
 Less than Cask lots add 25¢.
 German Coll.....60¢10¢10¢

Halters and Ties—

Halter Chains.....60¢10¢10¢10¢10¢
 German Halter Chain, list July 24,
 '97.....60¢10¢10¢10¢10¢
 Cow Ties.....60¢

Trace, Wagon, &c.—

Traces, Western Standard: 100 pair
 6 1/2-8-3, Straight, with ring.....\$30.00
 6 1/2-8-2, Straight, with ring.....\$31.00
 6 1/2-8-2, Straight, with ring.....\$35.00
 6 1/2-10-2, Straight, with ring.....\$38.00
 Add 2¢ per pair for Hooks.
 Traces 2¢ per pair higher than
 Straight Link.
 Trace, Wagon and Fancy Chains.....
 50¢10¢50¢10¢55¢

Miscellaneous—

Jack Chain, list July 10, '93:
 Iron.....60¢10¢60¢10¢10¢
 Brass.....60¢10¢60¢10¢10¢
 Safety Chain.....70¢5¢70¢10¢
 Gal. Pump Chain.....lb. 4¢4 1/2¢
 Covert Mfg. Co.:
 Breast.....35¢25¢
 Halter.....35¢25¢
 Heel.....35¢25¢
 Keel.....35¢25¢
 Stallion.....35¢25¢
 Covert Sad. Works:
 Breast.....70¢
 Halter.....70¢
 Fold Back.....70¢
 Rein.....70¢
 One da C' n and Halters.....40¢45¢55¢
 Am. Cow Ties.....45¢50¢55¢
 Eureka Coll and Halter.....45¢50¢55¢
 Niagara Coll and Halter.....45¢50¢55¢
 Niagara Cow Ties.....45¢50¢55¢
 Wire Dog Chains.....45¢50¢55¢
 Wire Goods Co.:
 Dog Chain.....60¢10¢
 Universal Dbl-Jointed Chain.....50¢
Chalk—(From Jobbers.)
 Carpenters' Blue.....gro. 42¢15¢
 Carpenters' Red.....gro. 37¢10¢
 Carpenters' White.....gro. 33¢35¢
 See also Crayons.

Chalk Lines—See Lines.**Checks, Door—**

Bardsley's.....40¢10¢
 Columbia.....50¢10¢
 Eclipse.....60¢60¢10¢

Chests—

American Tool Chest Co.:
 Boys' Chests, with Tools.....55¢
 Youth's Chests, with Tools.....40¢
 Gentlemen's Chests, with Tools.....30¢
 Farmers', Carpenters', etc., Chests,
 with Tools.....20¢
 Machinists' and Pipe Fitters' Chests,
 Empty.....15¢
 C. E. Jennings & Co.'s Machinists' Tool
 Chests.....20¢

Chisels—

Socket Framing and Firmer
 Standard List.....70¢5¢70¢10¢
 Buck Bros.....30¢
 Charles Buck & Co. Socket Firmer
 No. 10.....60¢10¢
 C. E. Jennings & Co. Socket Framing
 No. 15.....60¢10¢
 Swan's.....70¢55¢
 L. & J. White.....80¢30¢55¢

Tanged—

Tanged Firmers.....40¢5¢40¢10¢
 Buck Bros.....80¢
 Charles Buck.....30¢
 L. E. Jennings & Co. Nos. 191, 181.....25¢
 L. & J. White.....25¢55¢

Cold—

Cold Chisels, good quality, lb. 13¢15¢
 Cold Chisels, fair quality, lb. 11¢12¢
 Cold Chisels, ordinary.....lb. 8¢9¢

Chucks—

Beach Pat. each \$8.00.....30¢
 Massey's Planer and Milling.....15¢20¢
 Skinner Patent Chucks:
 Combination Lathe Chucks.....40¢
 Drill Chucks, Patent and Standard.....20¢
 Independent Lathe Chucks.....40¢
 Improved Planer Chucks.....25¢
 Universal Lathe Chucks.....40¢
 Face Plate Tool Co.....40¢
 Standard Tool Co.....40¢
 Improved Drill Chuck.....45¢
 Union Mfg. Co.:
 Combination.....40¢
 Gear Drill.....30¢
 Geared Scroll.....40¢
 Independent.....40¢
 Union Drill.....30¢
 Universal.....40¢
 Face Plate Jaws.....55¢

Clamps—

Adjustable, Hammer.....20¢20¢55¢
 Cabinet Sargent's.....50¢10¢

Carriage Makers', P., S. & W. Co. 40¢10¢
 Carriage Makers' Sargent's.....50¢10¢
 Best Parallel.....33¢10¢
 Lineman's, Union Drop Forge & Tool
 Co.....40¢
 Saw Clamps, see Vices, Saw Filers'

Cleaners, Sidewalk—

Star Socket, All Steel.....\$4.00 net
 Star Shank, All Steel.....\$3.75 net
 W. & S. Shank, All Steel, 7 1/2 in., \$4.25,
 \$3.05; 8 in., \$3.10; 8 1/2 in., \$3.25.

Cleavers, Butchers—

Foster Bros.....30¢
 New Haven Edge Tool Co.'s.....40¢
 Fayette R. Plumb.....33 1/2¢33 1/2¢10¢
 P. S. & W.....50¢50¢55¢
 L. & J. White.....25¢

Clippers—

Chicago Flexible Shaft Company:
 Handy Toilet.....\$7.50
 Mascotte Toilet.....\$7.50
 Monitor Toilet.....\$9.00
 Stewart's Patent.....\$10.00

Clips Axle—

Eagle and Superior 4 and 5-16
 inch.....70¢10¢
 Norway, 1/2 and 5-16 inch, 70¢10¢10¢
Cloth and Netting, Wire
 —See Wire, &c.

Cocks, Brass—

Hardware list:
 Compression and Plain Bibbs.....
 65¢55¢65¢10¢
 Globe, Kerosene, Racking, &c.,
 Cocks.....65¢10¢70¢

Coffee Mills—See Mills, Coffee.**Collars, Dog—**

Brass, Pope & Stevens' list.....40¢
 Embossed, Gilt, Pope & Stevens' list 30¢10¢
 Leather, Pope & Stevens' list.....40¢

Compasses Dividers, &c.—

Ordinary Goods.....75¢75¢55¢
 Bennis & Call Hdw. & Tool Co.:
 Dividers.....65¢
 Callipers, Call's Patent Inside.....65¢
 Callipers, Double.....65¢
 Callipers, Inside or Outside.....65¢
 Callipers, Wing.....60¢
 Compasses A. & T. V. Co.....55¢10¢
 J. Stevens A. & T. V. Co.....55¢10¢

Compressors Corn Shock—

J. B. Hughes' \$2.50.....\$2.50
Conductor Pipe, Galva.—
 L. C. L. to Dealers:

Territory. Not needed. Nested.
 Eastern.....70¢25¢10¢ 70¢55¢10¢
 Central.....55¢10¢1 70¢10¢
 Southern.....65¢10¢ 65¢25¢10¢
 S. Western.....50¢12 1/2¢10¢ 60¢15¢10¢

Terms: 25¢ for cash.
 Jobbers receive extra 12 1/2¢25¢ on car-
 loads rated, and extra 12 1/2¢ on car-
 loads rated.

See also: Eave Troughs.**Coolers, Water—**

Gal. each, 2 3 4 6 8
 Labrador \$1.20 \$1.50 \$1.50 \$2.10 2.20
 Gal. 2 3 4 6 8
 Iceland, ea. \$1.80 \$2.10 \$2.40 \$3.00
 Gal. 2 3 4 6 8
 Galv. Lined Ea. \$1.85 \$2.00 \$2.25 \$2.50 \$3.00
 25¢
 Galv. Lined side handles
 Gal. 2 3 4 6 8 5
 Each. \$1.95 \$2.15 \$2.40 \$3.00 \$4.15.25¢

Coopers' Tools—

See Tools, Coopers'.
Cord—Sash—
 Braided, Drab.....lb. 25¢
 Braided, White, Common, lb. 17¢18¢
 Cable Laid Italian, lb. A, 15¢; B, 16¢
 Common India.....lb. 9 9 1/2¢
 Cotton Sash Cord, Twisted.....13¢10¢
 Patent Russia.....lb. 12 1/2¢13¢
 Cable Laid Russia.....lb. 13 1/2¢14¢
 India Hemp, Braided.....lb. 14¢15¢
 India Hemp, Twisted.....lb. 10¢12¢
 Patent India, Twisted.....lb. 10¢12¢

Pearl Braided cotton.....lb. 17¢

Braided, Giant, White.....\$2.25
 Massachusetts, White.....\$2.25
 Eddystone Braided Cotton.....\$2.15
 Harmony Cable Laid Italian.....\$2.15

Crown, Solid Braided White.....\$2.25

Braided, Giant, White.....\$2.25
 Cable Laid Italian.....10¢
 Cable Laid Russian.....14¢
 Cable Laid India.....12¢
 Braided India.....18¢
 Braided, White.....19¢
 Bannison, No. 7 to 13.....19¢

Braided, Drab Cotton.....\$2.25

Braided, Italian Hemp.....\$2.25
 Braided, Linen.....\$2.40
 Braided, White Cotton, Spot.....\$2.25
 No. 6 cords, 1¢ extra.
 Silver Lake

A quality, Drab, 40¢.....15¢
 A quality, White, 35¢.....15¢
 B quality, Drab, 35¢.....15¢
 B quality, White, 30¢.....15¢
 Italian Hemp, 40¢.....15¢
 Linen, 57¢.....15¢

Wire, Picture—

Braided or Twisted.....85¢10¢
 Note.—There is a good deal of confusion
 in lists, some using old list and others the
 new list.

Corn Knives and Cutters

—See Knives, Corn.
Corn Planters—
 See Planters, Corn.
Crackers, Nut—
 Little Giant.....\$ gr. \$24.00

Cradles—

Grain.....50¢

Crayons—

White Round Crayons, gross 5 1/2¢50¢
 Cases, 100 gro., \$4.50, at factory.
 D. M. Stewart Mfg. Co.
 Metal Workers' Crayons, gr. \$2.50
 Soapstone Pencils, round, flat
 or square.....\$1.50
 Rolling Mill Crayons.....\$2.50
 Railroad Crayons (compo-
 sition) gr. \$2.00

See also Chalk.
Creamery Pails—See Pails, Creamery.

Crooks, Shepherds—

Fort Madison, Heavy.....\$ doz. \$7.00

Fort Madison, Light.....\$ doz. \$8.50

Crow Bars—See Bars, Crow.**Cultivators—**

Victor Garden.....\$ doz. \$10.00
Cutlery, Table—
 International Silver Company:
 No. 12 Medium Knives, 187.....\$ doz. \$3.50
 Star, Eagle, Rogers & Hamilton and
 Anchor.....\$ doz. \$3.00
 Wm. Rogers & Son.....\$ doz. \$2.50
 Simeon L. & Geo. H. Rogers Company:
 12 doz. Medium Knives.....\$ doz. \$3.00
 No. 77 Medium Knives.....\$ doz. \$2.50

Cutters—Glass—

H. H. Mayhew Co.....40¢
 Smith & Henshaw Co.....50¢

Meat—

Hale's, Nos. 11 & 11 1/2 & 11 1/2 & 11 1/2
 Per doz.....\$9.50 12.50 16.00
 American.....30¢
 Nos.....\$ 2 3 4 5 6
 Each.....\$5 \$7 \$10 \$25 \$50 \$60

Connecticut.....50¢
 No.....20 40 60 80 100
 Enterprise.....\$1.25 2.00 2.25 3.00 4.00
 Nos.....10 12 23 33
 Each.....\$2 \$3 \$2.50 \$4 \$6
 Dixon's.....\$ doz. \$30 \$40 \$50
 Nos.....\$14.00 \$17.00 \$19.00 \$30.00
 Home No. 1, \$ doz. \$22.75.....50¢10¢
 Little Giant.....\$ doz. \$30 \$35 \$40
 Nos. 305 310 312 320 322
 \$35.00 \$45.00 \$44.00 \$71.00 \$68.00
 Sterling.....\$39 \$45
 Nos.....\$5.00 \$5.50
 New Triumph No. 605, \$ doz. \$24.00

Woodruff's, \$ doz. \$30 \$40 \$40

Nos.....100 150
 Chadborn's Smoked Beef Cutter, \$ doz.
 \$15.00 \$18.00
Enterprise Beef Shavers.....25¢30¢

Slaw and Kraut—

Henry Diston & Sons:
 Slaw, Corn Grater, &c.....40¢
 Kraut Cutter—\$24 x 7, 26 x 8, 30 x 9, 55¢
 Kraut Cutters 30 x 12, 40 x 12.....10¢
 Tucker & Dorsey Mfg. Co.:
 Kraut Cutters.....40¢
 Slaw Cutters, 1 Knife, \$ gr.....\$18 \$20
 Slaw Cutters, 2 Knife, \$ gr.....\$22 \$26

Tobacco—

All Iron, Cheap.....\$ doz. \$4.25 \$4.50
 Enterprise.....25¢50¢
 National, \$ doz. \$21.00.....40¢
 Sargent's, \$ doz. No. 2.....45¢10¢
 Sargent's No. 2 and 21.....50¢10¢

Washer—

Appleton's, \$ doz. \$16.00.....50¢10¢10¢
 Bonney's.....40¢

Diggers, Post Hole, &c.—

Dalby Post Hole Auger.....per doz. \$9.00
 Iwan's Improved Post Hole Auger.....40¢
 Iwan's Perfection Post Hole Digger.....
 \$ doz. \$9.00

Kohler's Universal.....\$ doz. \$14.00

Kohler's Little Giant.....\$ doz. \$14.00
 Kohler's Hercules.....\$ doz. \$12.00
 Kohler's Invincible.....\$ doz. \$10.00
 Kohler's Rival.....\$ doz. \$9.00
 Kohler's Pioneer.....\$ doz. \$9.00
 Never-Break Post Hole Diggers, \$ doz.
 \$24.00.....80¢
 Samson, \$ doz. \$34.00.....25¢

Dividers—See Compasses.**Dog Collars—See Collars, Dog.****Door Checks—**

See Checks, Door.

Door Springs—

See Springs, Door.

Doors, Screen—

Porter's Plain, No. 6.....\$ doz. \$6.50
 Porter's Ornamental, No. 70, \$ doz. \$10.00

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, \$ doz.
 \$18; No. 2, \$15; No. 3, \$12; No. 4, \$18.

Drawing Knives—

See Knives, Drawing.

Drills and Drill Stocks—

Common Blacksmiths' Drill.....each
 \$1.50 \$1.75
 Blacksmiths' Self-feeding.....each
 \$3.75 \$4.00

Breast, Millers Falls, each \$3.00, 15¢10¢
 Breast, S. & W.....40¢40¢55¢
 Goodell Automatic Drill.....40¢50¢10¢
 Hus'n's automatic Drills Nos. 2 and
 3.....15¢
 Johnson's Drill Points.....25¢10¢
 Ratchet, Curtis & Curtis.....25¢
 Ratchet, Parker's.....40¢
 Ratchet, Weston's.....20¢25¢
 Ratchet, Whitney's, P. S. & W.....50¢
 Whitney's Hand Drill, No. 1, \$10.00.....
 Adjustable, No. 10, \$12.00.....33¢

Twist Drills—

Standard List.....60¢5¢60¢10¢
Drill Bits or Bit Stock
 —See Augers and Bits.

Drill Chucks—See Chucks.**Dripping Pans—**

See Pans, Dripping.

Drivers, Screw—

Screw Driver Bits.....per doz. 15¢70¢
 Balsey's Screw Holder and Driver, \$ doz.
 9-in. inch, \$8; 4-in., \$7.50 6-in., \$8.40
 Buck Bros' Screw Driver Bits.....30¢
 Champion.....40¢10¢
 Douglass Mfg. Co.....20¢20¢10¢
 Fray's Hol. H'dle Sets No. 3, \$12.00 50¢
 Gay's Double Action Ratchet.....35¢
 Goodell's Automatic.....50¢10¢10¢50¢10¢10¢55¢

Mayhew's Black Handle.....50¢
 Mayhew's Monarch.....40¢10¢
 New England Specialty Co.....50¢10¢
 Sargent & Co.'s:
 Nos. 1, 50, 55 and 60.....50¢10¢10¢
 Nos. 20 and 40.....60¢10¢
 Smith & Henshaw Co.....40¢55¢
 Stanley's R. & L. Co.'s:
 No. 64, Varnished Handles \$10¢10¢10¢
 No. 86.....70¢70¢10¢10¢
 Swan's:
 Nos. 65 to 68.....50¢
 No. 40.....40¢10¢
 Nos. 25, 35 and 45.....20¢10¢10¢

Eave Trough Galvanized

Territory. L. C. L.
 Eastern.....75¢10¢10¢
 Central.....75¢7 1/2¢1 1/2¢
 Southern.....70¢7 1/2¢10¢
 S. Western.....70¢10¢10¢
 Terms, 25¢ for cash.

See also Conductor Pipe and Elbows.**Egg Beaters—See Beaters, Egg****Egg Openers—**

See Openers, Egg.

Elbows and Shoes—

Factory shipments.....60¢
 Perfect Elbows (S. S. & Co.).....40¢

Emery, Turkish—

4 to 6 5 to 10 Flour
 Kegs.....lb. 5¢ 5 1/2¢ 5 3/4¢
 1/2 Kegs.....lb. 5 1/4¢ 5 1/2¢ 5 3/4¢
 Kegs.....lb. 5¢ 5 1/2¢ 5 3/4¢
 10-lb cans, 10 in case 6 1/2¢ 7¢ 6¢
 10-lb cans, less than 10.10¢ 10¢ 5¢
 NOTE.—In lots 1 to 3 tons a discount of
 10% is given.

Enameled and Tinned

Ware—See Ware, H. Low.

Escutcheon Pins—

See Pins, Escutcheon.

Extractors, Lemon Juice

See Squeezers, Lemon.

Fasteners, Blind—

Zimmerman's.....50¢10¢

Faucets—

Cork Lined.....70¢5¢70¢10¢55¢

Metallic Key, Leather Lined

70¢70¢10¢

Red Cedar.....60¢50¢10¢

B. & L. B. Co.:
 Lockport, Metal Plug, reduced list 60¢55¢
 Star.....60¢60¢55¢
 Star, Metal Plug new list.....40¢40¢55¢
 West's Lock, Open and Shut Key 50¢10¢
 John Sommer's Fearless Tin Key.....40¢
 John Sommer's Boss Tin Key.....50¢
 John Sommer's Victor Metal Key 50¢10¢
 John Sommer's Duplex Metal Key.....40¢
 John Sommer's Diamond Lock.....40¢
 John Sommer's L. X. L. Cork Lined.....50¢
 John Sommer's Reliable Key.....50¢10¢
 John Sommer's Chicago Cork Lined.....60¢
 John Sommer's O. K. Cork Lined.....50¢
 John Sommer's No Brand, Cedar.....50¢
 John Sommer's Perfection Cedar.....40¢
 McKenna, Brass:
 Burglar Proof, N. P.....35¢
 Improved, 3/4 and 1 1/2 inch.....35¢

Self Measuring:

Enterprise, \$ doz. \$30.00.....40¢10¢
 Lane's, \$ doz. \$30.00.....40¢10¢
 National Measuring, \$ doz. \$30.00.....40¢

Felice Plates—

Gates, Molasses and Oil - Stebbins

Marking, Mortise, &c., 55¢ 10¢ 55¢ 10¢ 20¢

Barrett's Comb. Roller Gauge, 55¢ 10¢ 55¢ 10¢ 20¢

Stanley R. & L. Co.'s Butt & Babbet Gauge, 20¢ 20¢ 10¢ 10¢

Wire, Brown & Sharpe's, 25¢

Wire, Morse's, 25¢

Wire P. S. & W. Co., 30¢ 30¢ 10¢

Cimlets—Single Cut—

Nail, Metal, Assorted, gro. \$1.00 @ 1.50

Spike, Metal, Assorted, gro. \$2.80 @ 3.25

Nail, Wood Handled, Assorted, gro. \$1.75 @ 2.00

Spike, Wood Handled, Assorted, gro. \$2.25 @ 2.50

Glass, American Window

Jobbers' List, Jan. 21, 1901.

From store, 30¢ 10¢

F.O.B. factory, carload lots:

Single strength, 10¢ 10¢ 7¢ 6¢

Double strength, 90¢ 10¢ 10¢

Glue—Liquid, Fish—

List A, Bottles or Cans, with Brush, 37½¢ 50¢

List B, Cans (½ pts., pts., qts.), 33½¢ 48¢

List C, Cans (½ gal., gal.), 25¢ 45¢

International Glue Co. (Martin's), 4¢ 10¢ 50¢

Glue Pots—See Pots, Glue.

Grease, Axle—

Common Grade, gro. \$5.00 @ 6.00

Dixon's Everlasting, 10¢ 10¢ 5¢ 5¢

Dixon's Everlasting, in bxs., 1 doz. 1 lb. \$1.20; 2 lb. \$2.00

Snow Flake:

1 qt. cans, per doz. \$2.00; 2 qt. \$2.20;

1 gal. cans per doz. \$6.00; 3 gal. 10¢

1 lb. 10¢; 5 gal. \$24.00

Grindstones—

Bicycle Enter, Grin ler, \$6.50

Bicycle Grindstones, each, \$2.50 @ 3.00

Pike Mfg. Co.:

Improved Family Grindstones,

per inch, per doz. \$2.00 (38¢)

Pike Mower, Knife and Tool

Grinder, each, \$4.00

Velox Ball Bearing, mounted, Angle

Iron Frames, each, \$3.25

Guards Snow—

Cleveland Wire Sp. Ing Co.:

Galv. Steel # 1000, \$9.00

Copper # 1000, \$18.00

Gun Powder—See Powder.

Hack Saws—See Saws.

Hacks Axl—

Peg Patent, Leather Top, \$4.50 @ 5.25

Peg Patent, Plain Top, \$3.50 @ 3.75

Sewing, Brass Ferrule, \$1.50 @ 1.60

Saddlers', Brass Ferrule, \$1.35 @ 1.45

Peg, Common, \$1.25 @ 1.35

Brad, Common, \$1.50 @ 1.75

Halters and Ties—

Covert Mfg. Co.:

Web, 45¢ 2¢

Jute Rope, 45¢ 2¢

Sisal Rope, 30¢ 4¢

Covert's Saddlery Works:

Web and Leather Halters, 70¢

Jute and Manila Rope Halters, 70¢

Sisal Rope Halters, 60¢ 20¢

Jute, Manila and Cotton Rope Ties, 70¢

Sisal Rope Ties, 60¢ 20¢

Hammers—

Handled Hammers—

Heller's Machinists', 50¢ 50¢ 5¢

Heller's Farriers', 50¢ 50¢ 5¢

Magnetic Tack, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

Auger, assorted, gro. \$2.30 @ 2.50

Brad Axl, gro. \$1.25 @ 1.50

Chisel Handles:

Apple Tanged Firmer, gro. ass'd,

\$2.25 @ 2.35; large, \$2.50 @ 2.60

Hickory Tanged Firmer, gro. ass'd,

\$1.75 @ 1.85; large, \$2.50 @ 2.70

Apple Socket Firmer, gro. ass'd,

\$1.70 @ 1.85; large, \$2.00 @ 2.25

Hickory Socket Firmer, gro. ass'd,

\$1.60 @ 1.75; large, \$1.75 @ 2.00

Hickory Socket Framing, gro. ass'd,

\$2.50 @ 2.75; large, \$2.65 @ 2.85

File, assorted, gro. \$1.00 @ 1.15

Hammer, Hatchet, Axe, etc., 60¢

Hand Saw, Varied, doz. 70¢ 75¢

Not Varied, 55¢ 60¢

Plane Handles:

Jack doz. 25¢; Jack Bolted, 55¢ 60¢

Fore, doz. 35¢ 38¢; Fore, Bolted, 70¢ 75¢

Nicholson Simplicity File Handle, 50¢

gro. \$0.85 @ 1.20

Hangers—

Barn Door, New Pattern, Round

Groove, Regular:

Inch, 3 4 5 6 8

Doz. \$0.35 1.20 1.50 1.90 2.50

Barn Door, New England Pattern, Check Back, Regular:

Inch, 3 4 5 6

Doz. \$1.30 1.75 2.50 3.00

Chicago Spring Butt Co.:

Friktion, 25¢

Oscillating, 25¢

Big Twin, 25¢

Baggage Car Door, 50¢

Elevator, 40¢

Railroad, 55¢

Columbian Hdw. Co., 35¢ 10¢

American Trackless, 35¢ 10¢

Crank Hanger, 60¢

1000's Axl, 60¢

Roller Bearing, 60¢ 10¢

Lane Bros.:

Parlor Ball Bearing, \$4.00

Parlor Standard, \$3.25

Parlor New Model, \$2.75

Parlor New Champion, \$2.25

Barn Door, Standard, 60¢ 10¢

Covered, 50¢ 10¢ 10¢ 5¢

Special, 80¢ 10¢

Lawrence Bros.:

Advance, 60¢

Cleveland, 70¢

Crown, 60¢

New York, 60¢

Peerless, 60¢ 10¢

Sterling, 60¢

McKinney Mfg. Co.:

No. 1, Special, \$1.50 @ 10¢

No. 2, Standard, \$1.80 @ 10¢

Myers' Station Hangers and Track,

50¢ 10¢ (net)

Stowell Mfg. and Foundry Co.:

Acme Parlor Ball Bearing, 40¢

Atlas, 50¢

Badger Barn Door, 50¢

Baggage Car Door, 50¢

Climate Anti-Friction, 50¢

Elevator, 40¢

Express, 50¢

Interstate, 50¢

Landy Parlor Door, 50¢

Magic, 50¢

Matchless, 60¢

Napier, 60¢ 10¢

Railroad, 50¢

Street Car Door, 50¢

Steel, Nos. 300, 401, 500, 40¢ 10¢

Stowell Parlor Door, 50¢

Wild West, Nos. 301, 401, 500, 50¢

Ladies' Melting—		
L. & W. Co.	25¢	
P. & W. Co.	50¢	
Reading	60¢	
Sargent's	40¢	40¢
Lanterns—Tubular—		
Regular 1 molar	doz. \$4.35	4.75
Left Tubular	doz. \$4.75	5.25
Hinge 1 molar	doz. \$4.75	5.25
Other Styles	doz. \$4.75	5.25
Bull's Eye Police—		
No. 1, 2 1/2 inch	\$3.50	
No. 2, 3 inch	\$4.00	
Latches, Thumb—		
Roggen's Latches	doz. 30¢	33¢
Lawn Mowers—		
See Mowers, Lawn		
Leaders—Cattle—		
Small	doz. 50¢	
Covert Mfg. Co.	45¢	
Lemon Squeezers—		
See Squeezers, Lemon		
Lifters, Transom—		
Solid Grip, Payson Mfg. Co.	80¢	
R. & E. Co.	45¢	
Lines—		
Wire Clothes, Nos. 18	19	20
100 feet	\$2.20	2.00
75 feet	\$1.80	1.70
Oswan Mills		
Crown Solid Braided Chalk	33¢	
Mason's, No. 0 to No. 3	33¢	
Samson Cordage Works		
Solid Braided Chalk, No. 0 to 3	40¢	
Silver Lake Braided Chalk, No. 0, \$6.00;		
No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50		
per gr.	30¢	
Locks—Cabinet—		
Cabinet Locks	33¢	33¢
Door Locks, Latches, &c.		
[Net prices are very often made on these goods.]		
Reading Hardware Co.	50¢	
R. & E. Mfg. Co.	40¢	
Sargent & Co.	40¢	40¢
Elevator—		
Stowell's	40¢	
Padlocks—		
Wrought Iron	7¢	10¢
R. & E. Mfg. Co. Wrt. Steel and Brass	50¢	
Sash, &c.—		
Fitch's		
Bronze and Brass	60¢	
Iron	10¢	
Ives' Patent		
Bronze and Brass	60¢	
Iron	10¢	
Wrought Bronze and Brass	55¢	
Wrought Steel	50¢	
Payson's Signal	60¢	
Reading	60¢	10¢
Machines—Boring—		
Common, Upright, Without Augers	\$2.00	
Common, Angular, Without Augers	\$2.25	
Without Augers.		
R. & E. Mfg. Co.: Upright	Angular	
Improved No. 3, \$4.25	No. 1, \$5.00	
Improved No. 4, 3.75	No. 2, 3.38	
Improved No. 5, 2.75		
Jennings	2.50	
Miller's Falls	2.50	
Snell's, Rice's Pat.	2.50	
Swan's, No. 500	5.10	No. 200 6.45
Holisting—		
Moore's Anti-Friction Differential Pulley Block	30¢	
Moore's Hand Hoist, with Lock Brake	20¢	
Moore's Portable Pneumatic Hoist	25¢	
Ice Cutting—		
Chandler's	15¢	
Washing—		
Wayne American	doz. \$24.00	
Western Star, No. 2	doz. 25.00	
Western Star, No. 3	doz. 30.00	
St. Louis, No. 41	doz. 60.00	
Mallets—		
Hickory	55¢	50¢
Lignumvite	55¢	50¢
Tinners', Hickory and Applewood	doz. 50¢	50¢
Door—		
Elastic Steel (W. G. Co.)	10¢	
Mattocks—		
See Picks and Mattocks		
Meat Cutters—		
See Cutters, Meat		
Milk Cans—See Cans, Milk—		
Mills—Coffee—		
Enterprise Mfg. Co.	25¢	30¢
National, list Jan. 1, '04	30¢	
Parker's Columbia and Victor	30¢	
Parker's Box and Side	50¢	60¢
Swift, Lane Bros.	50¢	60¢
Mining Knives—		
See Knives, Mining		
Molasses Gates—		
See Gates, Molasses		
Money Drawers—		
See Drawers, Money		
Mowers Lawn—		
Net prices are generally quoted.		
Cheap	all sizes, \$1.90	1.95
Good	all sizes, \$2.25	2.50
10	12	14
High Grade 4.25	4.50	4.75
Continental	5.00	
Great American	5.00	
Great American Ball Bearing	60¢	10¢
Quaker City	70¢	
Pennsylvania	90¢	10¢
Pennsylvania Golf	50¢	
Pennsylvania Horse	40¢	
Pennsylvania Pony	45¢	
Philadelphia		
Style M, S. C. K. T.	70¢	5¢
Style A, all Steel	65¢	0¢
Style E, Low Wheel	60¢	10¢
Style K, High Wheel	70¢	10¢
Drexel and Gold Coin, low list	50¢	55¢
Nails—		
Cut and Wire. See Trade Report.		
Wire Nail and Brads, Papered.		
List July 30, 1899, 85¢	10¢	85¢
Hungarian, Finishing, Upholsterers', etc. See Tacks.		

Horse—		
Nos. 6 7 8 9 10		
A. C.	25¢	23¢
Ausable	24¢	23¢
C. B. K.	25¢	23¢
Champion	28¢	25¢
Clinton	19¢	17¢
Maud S.	25¢	23¢
Putnam	23¢	21¢
Vulcan	23¢	21¢
American, Nos. 0 to 10	10¢	9¢
Neposet	10¢	9¢
Jobbers' special brands	per lb.	8¢
Picture		
1 1/2 2 3 3 1/2 in.		
Brass Head	45¢	50¢
Por. Head	1.10	1.10
Nippers, See Pliers and Nippers.		
Nut Crackers—		
See Crackers, Nut.		
Nuts—		
Cold Punched	Off list.	
Mfrs. or U. S. Standard		
Square, plain	\$1.70	4.80
Hexagon, plain	\$1.90	5.00
Square, C. T. & R.	\$1.90	5.00
Hexagon, C. T. & R.	\$5.00	5.40
Hot Pressed:		
Mfrs. U. S. or Nar. Gauge Stan'd.		
Square Blank	\$5.00	5.10
Hexagon Blank	\$5.30	5.40
Square Tapped	\$4.80	4.90
Hexagon Tapped	\$5.10	5.20
Oakum—		
Best or Government	lb. 64¢	
Navy	lb. 5¢	
U. S. Navy	lb. 54¢	
Plumbers' Spin Oakum	34¢	
In carload lots 1/4 lb. off f. o. b. New York		
Oil Axle—		
Snow Flake		
1 qt. cans, per doz.	\$3.00	
1 qt. cans, per doz.	\$4.80	
1 gal. cans, per doz.	\$15.00	
5 gal. cans, per doz.	\$66.00	
Oil Tanks—See Tanks, Oil.		
Oilers—		
Brass and Copper	40¢	10¢
Tin or Steel	60¢	10¢
Zinc	60¢	10¢
Paragon:		
Brass and Copper	40¢	10¢
Tin or Steel	60¢	10¢
Zinc	60¢	10¢
Malleable, Hammers' Improved, No. 1	\$3.60	
No. 2, \$4.10; No. 3, \$4.40; per doz. 20¢		
Malleable, Hammers' Old Pattern, same list	50¢	10¢
Wilmet & Hobbs Mfg. Co.		
Spring Bottom Cans	70¢	70¢
Railroad Oilers etc.	60¢	60¢
Openers—Can—		
French	doz. 35¢	
Iron Hand	doz. 25¢	27¢
Sprague, Iron Hdl.	per doz. 35¢	40¢
Sardine Scissors	doz. \$1.75	\$3.00
Tip Top	per doz. \$0.75	
National, per doz.	\$1.75	\$3.00
Stowell's, per doz.	35¢	45¢
Waldorf, per doz.	45¢	
Egg—		
Nickel Plate	per doz., \$2.25	
Silver Plate	per doz., \$3.50	
Packing—		
Asbestos Packing, Wick and Rope	15¢	15¢
Rubber—		
Sheet, C. I.	8¢	18¢
Sheet, C. O. S.	9¢	18¢
Sheet, C. B. S.	10¢	18¢
Sheet, Pure Gum	50¢	70¢
Sh. et. Red	35¢	40¢
Jenkins' Standard, per doz.	25¢	25¢
Miscellaneous—		
American Packing	70¢	10¢
Cotton Packing	15¢	14¢
Italian Packing	9¢	12¢
Jute	3¢	4¢
Russia Packing	7¢	11¢
Pails—Creamery		
S. & S. Co., with gauges, No. 1 \$0.50;		
No. 2, \$0.75; per doz.		
Galvanized—		
Price per doz.		
Quart.	10	12
Water, Regular	1.75	2.00
Water, Heavy	3.40	3.80
Fire, Rd. Bottom	2.35	2.50
Well	2.50	3.00
Pans—Dripping—		
Standard List	50¢	10¢
Fry—		
Common Lipped:		
No. 1	1	2
Per doz.	\$0.60	75¢
Roasting and Baking—		
Regal, S. S. & Co., per doz., Nos. 5, \$4.50;		
10 \$5.00; 20 \$5.50; 30 \$6.00;		
Simplex, per doz., No. 40 \$30.00; 50,		
\$34.50; 60 \$39.00; 140, \$43.00; 150,		
\$47.50; 160, \$43.00.		
Paper—Building Paper—		
Asbestos	lb.	
Building Felt	3¢	
Mill Board, sheet, 1/4 x 40 inches	4¢	
Mill Board, roll, thicker than 1-16		
inch	3¢	
Mill Board, roll, 1-16 in. thick and		
less	3¢	
Per roll		
Roan Sized Sheathing:		
Light wt. 30 lbs. to roll	\$0.32	
Medium wt. 30 lbs. to roll	\$0.47	
Heavy wt. 40 lbs. to roll	\$0.53	
Medium Grades Water Proof		
Sheathing	\$0.65	1.25
Deafening Felt, 6 and 1 1/2 sq. ft.		
to lb., ton	\$4.00	\$42.00
Red Rope Roofing, 250 sq. feet per		
roll	\$1.65	

NOTE.—These goods are often sold at delivered prices.

Tarred Paper.

1 ply (roll 300 sq. ft.), ton	\$35.00	\$30.00
2 ply, roll 100 sq. ft.	40¢	45¢
3 ply, roll 100 sq. ft.	60¢	65¢
Slater's Felt (roll 500 sq. ft.)	50¢	55¢

NOTE.—Above prices often include delivery.

R. R. Stone Surfaced Roofing (roll 110 sq. ft.)

	\$2.75
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Sand and Emery—

List Dec. 23, 1899	60¢	60¢
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Parers—Apple—

Advance	doz. \$4.50	
Baldwin	doz. \$5.00	
Bonanza	each \$7.50	
Landy, 1898	each \$10.00	
Eureka	doz. \$12.00	
Family Bay State	doz. \$4.00	
Hudson's Little Star	doz. \$5.50	
Hudson's Rocking Table	doz. \$5.50	
Improved Bay State	doz. \$7.00	30.00
New Lightning	doz. \$5.50	
Reading 73	doz. \$4.00	
Reading 79	doz. \$7.00	
Turn Table '98	doz. \$5.50	
White Mountain	doz. \$4.00	

Potato—

Saratoga	doz. \$5.50
White Mountain	doz. \$4.50

Paris Green

Arsenic keys or casks	11 1/2¢	12 1/2¢
Keys, 100 to 175 lbs.	13¢	13¢
Keys, 14, 28, 56 lbs.	13¢	13¢
Paper boxes, 2 to 5 lbs.	13¢	14¢
Paper boxes, 1 lb.	13¢	14¢
Paper boxes, 1/2 lb.	14¢	15¢
Paper boxes, 1/4 lb.	15¢	16¢

Picks and Mattocks—

List Feb. 23, 1899	70¢	70¢
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Pigeons—Clay

Markle's Black Birds, f. o. b. factory, per m.	\$3.75
See also Traps, Target.	

Pinking Irons—

See Irons, Pinking.

Pins—Escutcheon—

Brass	60¢	60¢
Iron, list Nov. 11, '85	60¢	60¢

Pipe, Cast Iron Soil—

Standard, 2-6 in.	60¢	7 1/2¢
Extra Heavy, 2-6 in.	70¢	
Fittings	75¢	5¢

Pipe, Merchant, Boiler

Black	Galva-	
1/4 to 1/2 inch	60¢	43¢
1/2 to 1 inch	67¢	55¢
Boiler Tubes	Up to	
Steel	22 feet	
1 to 1 1/2 inch, inclusive	45¢	
2 1/4 to 5 inch, inclusive	64¢	
1 1/2 to 2 1/4 and 6 to 13 inches	68¢	
iron		
1 to 1 1/2 inch and 2 1/2 in.	45¢	
2 1/4 to 5 in.	60¢	
1 1/2 to 13 inch	50¢	
Casting, Cut Lengths.	81¢ & S.	
2 to 8 inch	52¢	
3 1/4 to 12 inch	57 1/2¢	
4 to 13 inch	59 1/2¢	

Pipe Sewer—

Standard Pipe and Fittings, 2 to 2 1/2 in.	70¢
New England	70¢
New York and New Jersey	70¢
Maryland, Delaware, East Penn.	70¢
West Penn. and West Va.	70¢
Virginia	70¢
Ohio, Michigan and Ky.	70¢
Carload lots are generally delivered.	

Planes and Plane Irons—

Wood Planes—

Molding	40¢	2 1/4¢
First quality 1 1/2 to 10 1/2	40¢	10 1/2¢
Second quality 1 1/2 to 10 1/2	40¢	10 1/2¢
Bayley's (Stanley & L. Co.)	25¢	10¢
Gage Self Setting	25¢	10¢

Iron Planes—

Bayley's (Stanley & L. Co.)	25¢	10¢
Chaplin's Iron Planes	25¢	10¢
Miscellaneous Planes (Stanley & L. Co.)	25¢	10¢
Sargent's	50¢	10¢

Plane Irons—

Wood Bench Plane Irons	30¢	50¢
Buck Bros.	30¢	
Stanley & L. Co.	20¢	10¢
L. & J. White	20¢	25¢

Planters, Corn, Hand.

Kohler's Eclipse	doz. \$0.00
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Plates—

Felloe	lb. 34¢	40¢
Self-Sealing Pie Plates (S. S. & Co.)	doz. \$2.00	

Pliers and Nippers—

Button Pliers	70¢	10¢		
Gas Burner, per doz., 5 in.	\$1.15			
Gas Pipe, 7 8 10 12 in.	\$1.75	\$2.00	\$2.75	\$3.75
Acme Nippers	50¢	50¢		

Parallel Pliers, &c

Paragon Pliers	50¢	50¢
Lodi Pliers	50¢	50¢
Elm City Fence Pliers	50¢	50¢
Cronk Hanger Co.		
American Button	75¢	10¢
Cronk's	60¢	
Improved Button	70¢	10¢
Stub's Pattern	50¢	
Combination and others	25¢	
Heller's Farriers' Nippers, Pinchers		
and Tools	50¢	50¢
P., S. & W. Tinners' Cutting Nippers	30¢	10¢
Swedish Steel, End and Diagonal Cutting Pliers	50¢	
Pliers and Nippers, all kinds	40¢	

Plumbs and Levels—

Plumbs and Levels	75¢	10¢
Davis Iron, Machinist Nos. 1 to 14	20¢	
Davis Iron, Adjustable Nos. 6 to 49	35¢	
Diston's	30¢	
Pocket Levels	75¢	10¢